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SEPTEMBER 1999

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Tom Duffy, K3LR, W. Middlesex, PA

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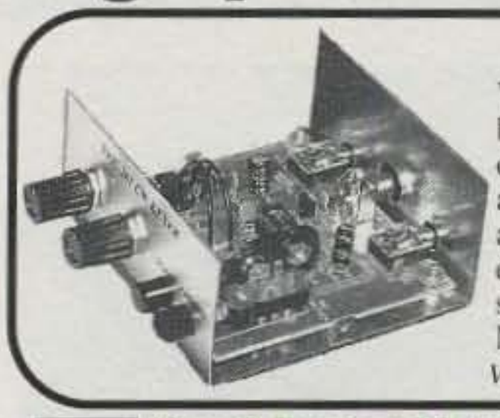

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CQ Amateur Radio

SEPTEMBER 1999 VOL. 55, NO. 9

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ON THE COVER: Tim Duffy, K3LR, of West Middlesex, PA is the man behind the winning Multi-Operator, Multi-Transmitter USA score in the 1998 CQ WW DX Phone Contest. Full results of the contest begin on page 9, but K3LR's line score of 15,428,117 points, 6652 QSOs, 192 Zones, and 761 Countries is impressive enough to warrant special mention here. What makes this winning score all the more impressive is the fact that Tim's QTH is about as far west in Zone 5 as you can get before becoming Zone 4—2 miles from the Ohio/Pennsylvania line. Why, that makes K3LR almost a midwestern station. And it also makes this the most western station since W7RM about 30 years ago to take top USA MOMT honors in the CQ WW DX Phone Test. (Photo by Larry Mulvehill, WB2ZPI)

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Zero Bias

An Editorial

This is a Zero Bias I never thought I'd have to write.

Those of you who have followed this page any time since 1976 have had the privilege of reading the entertaining, insightful words of my very dear friend Alan M. Dorhoffer, K2EEK. I'm sad to report that on July 19, 1999, Alan succumbed to the effects of cancer. He was 61 years of age, an age at which all reason declares that one should have decades of productive life ahead. But cancer doesn't listen to reason.

Allow me to summarize Al's brief bout with this scurrilous killer.

About the time of the Dayton Hamvention Al began to complain about a bloated feeling in his abdomen. He suspected that perhaps his diet of hamfest food and Chinese take-out might be conspiring to foul up his digestive system. Like too many of us men, Al had a serious aversion to doctors, and so decided to self medicate. A trip to the supermarket yielded several large bottles of good old prune juice, which he downed with delight. The effects were quick and obvious, and any thoughts that hamfest food was the culprit were quickly dispelled. So far, it's a funny "Al story."

When Al was unable to stop the diarrhea, he became concerned enough to consult a physician friend for help. After all, he was now losing weight and had begun to feel lethargic. "Obviously the damned prune juice," he thought. Wouldn't you? The doctor offered that chances were it was a spastic colon, and prescribed a remedy. However, in his wisdom, his doctor friend seized the fact that Al was a "captive audience" and sent him for a blood test to try to rule out other causes for the problem. The test results were somewhat inconclusive, and so the doctor ordered a second blood test. That test revealed that his liver chemistry was substantially different from what it should have been.

Fearing a serious problem, the doctor immediately set him up with an appointment with a gastroenterologist, who took one look at the liver enzymes and ordered a CAT scan to try to see what might be going on inside. Our lovely medical insurance system being what it is, several days elapsed before the scan, and several more before the results became available. It was decided by his doctors that a colonoscopy was in order, and they ordered the test. Total elapsed time so far: about 7 weeks. Alan had lost about 30 of his normal 175 pounds by now. He was dehydrating, he was malnourished, and Gail Schieber, his ever-supportive Managing Editor and friend, another friend, Bob Macrae, as well as yours truly did all we could to see to it that he ate and drank something, usually with little success. By now, Gail and I had interceded on Al's behalf with the medical community to push and press and cajole—anything to help this guy we treasured so much. Al was a bachelor living alone . . . we were his family. He had no other living relatives of which we were aware.

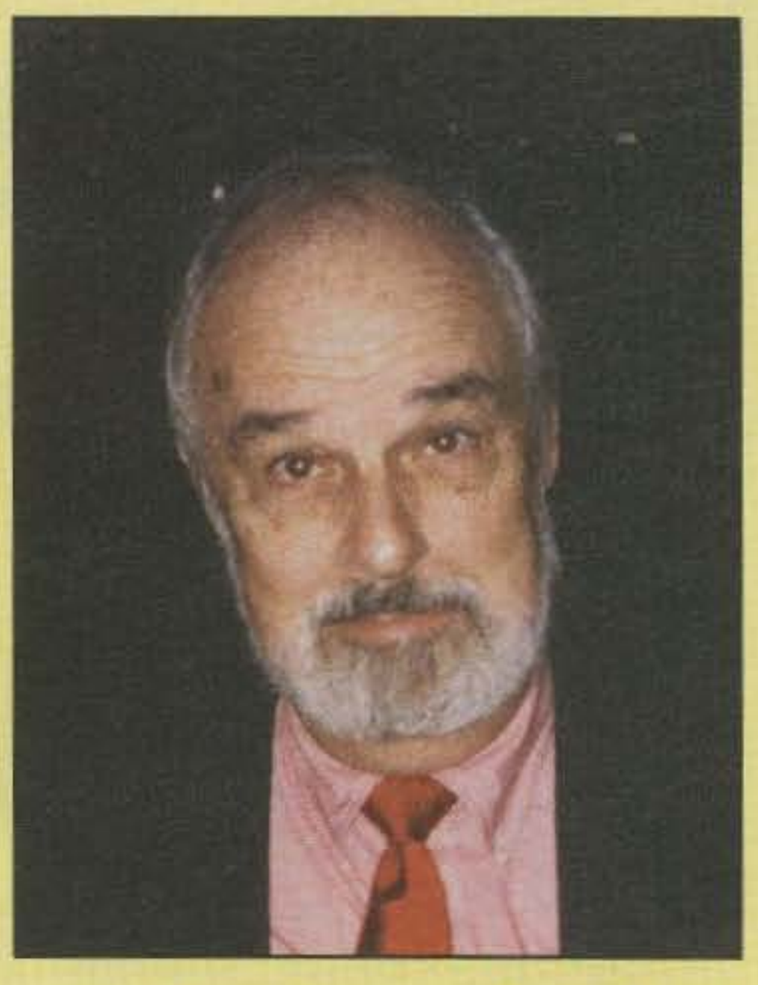
The weekend of July 11, Al finally confessed to Gail that he was so weak and debilitated that he had no choice but to go into the hospital. The time for denial had passed. After again interceding with his doctor, on Monday, July 12, we asked Bob Macrae to rush him to the Emergency Room of Saint Francis Hospital in Roslyn, New York. In the ER he was met by two oncological surgeons who informed him that he had colon cancer and was not expected to have a long and fruitful life ahead of him. He underwent about 6 hours of surgery on Tuesday, July 13. The surgery revealed not only a complete cancerous blockage of the colon, but that the colon had perforated and caused an infection. If that were not enough, his liver was wracked with cancer and barely functional. The cancer had also spread to his lungs. His kidneys began to shut down due to the septic shock caused by the infection, and over the next five days, his body gradually shut down. Al died at 8:25 AM EDST on Monday, July 19. Elapsed time from the first admission by Al that he had a problem: approximately 9 weeks. Let me say that again for emphasis: NINE WEEKS!

So why am I regaling you with all the gory details of the death of my friend and colleague of the past 42 years? Why am I taking this space at this time of grieving to give a detailed, blow-by-blow description of how the best friend I've ever had beyond my wonderful wife Cathy spent the last two months of his life? Simply to reinforce the messages that every one of us has heard time and time again. For better or for worse, ours is a predominantly male hobby with a median age over 50 years, and quite obviously, not in the best of physical shape. Heed the messages:

- Don't ignore any sudden unexplained changes in your body functions.
- Get regular, thorough medical check-ups, because not everything that will kill you will give you a warning.
- After the age of 45 get yourself checked regularly for early signs of colon and prostate cancer.
- Find a doctor you trust, and visit him or her for a base-line physical for future reference.
- Be aware of what you feed your body, and how you pollute it. Somehow, I doubt that we'll ever hear on the eleven o'clock news that cheeseburgers cure heart disease or that smoking prevents cancer.

You're blessed with only one chance to live your life. You're allotted only one body, and it's amazing how it always lasts a lifetime. It's just that some lifetimes are a lot shorter than others.

How does this relate to the death of K2EEK? Al smoked heavily. He ate a generally poor diet. He rarely exercised. He had never had a physical exam except the one Uncle Sam provided in the US Army. He never had a blood test. He never had a chest X-ray. He never had a PSA test to detect prostate cancer. He never had a colonoscopy to detect colon cancer. He never had a urine or blood test to detect diabetes. And he never saw his 62nd birthday either.



CQ Editor Alan Dorhoffer, K2EEK, 1938-1999.

There are two tragedies here. One is that Alan Dorhoffer, K2EEK, is dead at the age of 61 years. The other is that his premature death was preventable. A few simple adjustments to his lifestyle and an occasional checkup and it would probably be Al filling this page this month instead of a grieving friend. If you're not willing to do it for yourself, my friends, do it for those who will mourn your death.

Good-bye, Al. We loved you and will miss you forever. Damn it, man, you were so stubborn.

Dick, K2MGA

A Note on the Changes in *CQ*

Some of you may notice a few graphic design changes beginning in this issue of *CQ*. In light of the sudden death of *CQ* Editor K2EEK, a few words of explanation are in order. The changes in this issue—more use of full color, more contemporary design of some departments, and more adventurous design of some articles—were begun and planned long before Al or anyone else, for that matter, became aware of his impending health crisis. We mention that fact to dispel any thoughts our readers may have that these changes are in any way related to Al's untimely passing. *—K2MGA*

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VSWR Typical Minimum	1.1:1	1.1:1	1.1:1	1.1:1	1.1:1	1.1:1
VSWR 1.5:1 Bandwidth, KHz	150	> 350	> 450	> 750	*	**
Power Rating, KW Output	1.5	1.5	1.5	1.5	2.0	2.0
3dB Beamwidth, Degrees	70	56	56	56	55/57/64	64
Side Lobe Attenuation, dB	>35	>40	>40	>40	>40	>40
Boom Length, feet (m)	22 (6.7)	35 (10.7)	24 (7.3)	19 (5.8)	28 (8.53)	18 (5.49)
Boom Diameter, inches (cm)	2.5 (6.35)	2.5 (6.35)	2.5 (6.35)	2.5 (6.35)	2.5 (6.35)	2.5 (6.35)
Longest Element, feet (m)	43 (13.1)	36.3 (11.1)	24 (7.3)	18 (5.5)	36.7 (11.2)	36.7 (11.2)
Turning Radius, feet (m)	24.3 (7.4)	25.9 (7.9)	16.3 (5.0)	13.0 (4.0)	21.7 (6.61)	20.0 (6.09)
Max Mast Size, inches (cm)	2.5 (6.35)	2.5 (6.35)	2.5 (6.35)	2.5 (6.35)	2.5 (6.35)	2.5 (6.35)
Wind Surface Area, sq ft (sq m)	5.5 (.51)	9.2 (.85)	4.5 (.41)	3.4 (.32)	9.9 (.92)	7.9 (.73)
Wind Load @ 80 mph, lbs (kg)	142 (64.4)	250 (113.4)	115 (52.3)	85 (38.5)	255 (116)	202 (92)
Weight, lbs (kg)	55 (25)	92 (41.8)	47 (21.1)	38 (17.2)	85 (38.5)	60 (27.2)

* X9 - (20M) 350, (15M) 450, (10M) 1500

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Announcements

• **YLRL Howdy Days** – Sponsored by the YLRL, from 1400Z Sept. 17 to 0200Z Sept. 19. YLs only. Send member or nonmember. Score 2 pts/QSO with member; 1 point/QSO nonmember. Final score is total QSO points. Use maximum 750W CW, 1500W SSB, RTTY contacts allowed. Freqs.: 3.550, 3.950, 7.050, 7.250, 14.050, 14.276, 21.133, 21.388, 28.176, 28.376. Awards. SEnd logs postmarked within 30 days to: Cleo Bracket, KØJFO, 810 Towne Square Dr., Fremont, NE 68025-7000.

• **Indiana RC Council Bison Stampede** – Sponsored by the Goshen ARC, this is the third annual Indiana QSO party to get all Indiana counties on the air to celebrate the 52nd anniversary of the council. From 1800Z Sept. 11 to 0200Z Sept. 12, all amateur bands, 1.8–446 MHz (excluding 30, 17, 12 meters). No repeater or cross-band QSOs. Freqs.: CW 3.55, 7.05, 14.05, 28.12 MHz; SSB 3.89, 7.29, 14.29, 28.39, 50.129, 52.525, 144.2, 146.52, 223.5, 446.0 MHz. For more details, contact IRCC Bison Stampede, 24237 CR 24, Elkhart, IN 46517, or e-mail: <n9i@juno.com>.

• **These Special Events are scheduled for Sept.:**

W1NRG, from Durham, CT Agricultural Fair; CW and SSB on the bottom of General HF bands. For certificate, send QSL with SASE to W1NRG, MARC, P.O. Box 583, Meriden, CT 06450.

K2BR, from Miss America Pageant, Atlantic City, NJ; SCARA; 1400Z Sept. 13 to 0400Z Sept. 19; SSB 28.325, 21.325, 14.250, 7.250 MHz; CW 28.030, 21.050, 14.050, 7.050 MHz. For QSL send QSL and #10 SASE to SCARA, P.O.B. 121, LInwood, NJ 08221.

W2UXC, from commemoration of battle of Plattsburgh, Plattsburgh, NY; Champlain Valley ARC; 1400Z Sept. 11 to 1900Z Sept. 12; on 7.265 or 14.265 MHz.. For certificate send SASE to CVARC, P.O. Box 313, Morrisonville, NY 12962.

WA2VJA, from CQ Labor Day celebration, Nutley, NJ; Robert D. Grant United Labor ARA; 1200Z Sept. 3 to 2400Z Sept. 6; on 28.420 and 52.525 MHz. For certificate QSL to RDGULARA, P.O. Box 716, Nutley, NJ 07110-0716.

K3DN, from 50th anniversary of Welcome House, Perkasie, PA; Warminster ARC; 1300–1900Z Sept. 26; on 7.240, 7.040, 14.250, 21.350. For certificate QSL to Warminster ARC, P.O. Box 113, Warminster, PA 18974.

KE4ZXW, from celebration of 4 years of 9600 baud automatic satellite station operation and amateur radio exhibit, Virginia Air & Space Center, Hampton, VA; VASC Amateur Radio Group; Sept. 25–26, 0–2400Z on UO-22 or KO-25; 1500–2200Z @ :00 on 7.265, @ :15 on 14.265, and @ :30 on 28.365. For anniversary QSL send SASE to Ed Brummer, W4RTZ, 108 Oyster Cove Rd., Yorktown, VA 23692.

KS4DC, from Dickenson County, VA Pioneer Days; Sept. 12–18; all bands and modes. For certificate send QSL and SASE to Phil Mohon, KU4RK, 727 Cresswood Dr., Richlands, VA 24641.

W5SLA, from Qzone ARC commemoration of 35 years of community service; 1300–2100Z Sept. 18; 14.250 and 7.280 ±QRM. For certificate send SASE to Michael White, 404 Holmes Dr., Slidell, LA 70460.

KB8UUZ, from National POW/MIA Awareness Week, Freedom Township, OH; Portage ARC; 2000Z Sept. 10 to 0300Z Sept. 20; General portion of 10, 15, 20, 40 meters. For certificate send QSL and large (8 1/2 × 11) SASE to Tom Parkinson, KB8UUZ, 9992 State Route 700, Mantua, OH 44255.

N8EMZ, from EAA Fly-in, Washington Court House, OH; Fayette ARA; 1500–2100Z Sept. 4 and 5; on 7.235, 14.260, 21.350, 28.360. For certificate send QSL and 9 × 12 SASE to Kenny Rowley, 2895 White Rd., New Holland, OH 43145.

W8LBZ, from Middle Bass Island (OH004) in Lake Erie; Saandusky Radio Experimental League; 1600Z Sept. 25 to 1600Z Sept. 26; on 7.230, 14.235, 28.350 MHz. For certificate send QSL and SASE to W8LBZ Callbook address.

W8M, from M&M ARC 50th anniversary, Menominee, MI; 1500–2100Z Sept. 18; on 7.250, 14.250, 21.350, 28.450 MHz. For certificate send QSL and SASE to M&M ARC, P.O. Box 1082, Marinette, WI 54143.

W8YAF, from YAF Founder's Day, Yankee Air Museum, Belleville, MI; 1200–2000Z Sept. 26; on 7.270 ±. For certificate send QSL and 9 × 12 SASE to Frank Nagy, N8BIB, 24315 Waltz Rd., New Boston, MI 48164-9167.

W8ZX, from 60th anniversary of Tusco ARC, Tuscarawas county, OH; 1400–0100Z Sept. 18 and 1600–2100Z Sept. 19; lower end of the 20, 15, 10 meter phone bands. For QSL send QSL and SASE to Tusco ARC, P.O. Box 725, New Philadelphia, OH 44663-0725.

WC8EC, from Volcano Days, Wood Co., WV; 1600–1600Z Sept. 24–25; on 3840–3865, 7220–7240, 146.520. For certificate sned SASE to Wood County Emergency Communications Inc., P.O. Box 3328, Parkersburg, WV 26103.

ZM1OSJ, from 900-year anniversary of the Order of St. John ambulance service; Rotorua Area, New Zealand; Sept. 25 to Oct. 2 on the HF bnads, phone and CW. QSL via ZL1CDX.

• **The following hamfests are slated for late August and September:**

Aug. 28, **West Virginia State Radio Council Hamfest/ARRL Convention**, Jackson's Mill State Conference Center, Weston, WV. Contact Dick Fowler, 304-623-9479; e-mail: <wvsarc@qsl.net>).

Sept. 4, **Ottawa ARC Hamfest**, Carp Agricultural Fairgrounds, **Carp, Ontario, Canada**. Contact Jim Cummings, VE3XJ, 613-446-1225; <fleamarket@oarc.net>; web: <http://oarc.net/fleamarket>.

Sept. 4, **Alamogordo Hamfest**, Otero County Fairgrounds, **Alamogordo, NM**. Contact Larry Moore, WA5UNO, 1830 Corte Del Ranchero, Alamogordo, NM 88310 (505-437-0145, day/evening). (Exams)

Sept. 4, **Uniontown ARC 50th Annual Gabfest**, Club Grounds, Old Pittsburgh Rd., **Uniontown, PA**. Contact Carl (WA3HQK) or Joyce (KA3CUT) Chuprinko, 84 Heaven Hill Rd., Morgantown, WV 26508 (304-594-3779).

Sept. 10–11, **Queen Wilhelmina Hamfest**, Queen Wilhelmia State Park, **Mena, AR**. Contact Ray, W5DLC, at <raysoft@intrastar.net>. (Exams)

Sept. 11, **Saratoga County RACES Assn. Hamfest**, Saratoga County Fairgrounds, **Ballston Spa, NY**. Contact Darlene Lake, N2XQG, 314 Louden Road, Box #84, Saratoga Springs, NY 12866 (518-587-2385; packet: <n2xqg@wa2umx>; e-mail <lake@capital.net>). (Exams)

Sept. 11, **Erie Hamfest '99**, Franklin Twp. Firehall, **Erie, PA**. Contact Dr. Tom McClain, N3HPR, 3954 Solar Dr., Erie, PA 16506 (814-833-1640; e-mail <tem@erie.net>). (Exams; handicapped accessible)

Sept. 11, **Central Missouri RA Hamfest**, Good Time Country Facility, **Columbia, MO**. Contact Bruce Olde, KØZY, 3315 Berrywood, Ste. 101, Columbia, MO 65201 (phone 573-875-5246; e-mail: <bruceo@odle-associates. com>. (Exams)

Sept. 11, **East Central Minnesota ARC Hamfest**, Rush City High School, **Rush City, MN**. Contact Larry Jilek, KAØMEN, 320-358-4205.

Sept. 11–12, **Greater Louisville Hamfest/ARRL KY State Convention**, Bullitt County Fairgrounds, **Louisville, KY**. Call 502-935-7197; web: <http//www.thepoint.net/~glha/>.

Sept. 12, **Findlay RC Hamfest '99**, Hancock County Fairgrounds, **Findlay, OH**. Contact Dave Hoxworth, AA8KJ, 443 Starlet Oak Drive, Findlay, OH 45840 (419-423-3402.

Sept. 12, **Bolingbrook ARC Hamfest '99**, Inwood Recreation Center, **Joliet, IL**. Contact Marti, KA9ZJJ, 345 Gehrig Circle, Bolingbrook, IL 60440 (815-436-0559). (Exams)

Sept. 18, **L'Anse Creuse ARC Hamfest**, L'Anse Creuse High School, **Mt. Clemens, MI**. Contact Betty McGinn, N8SIH, 810-791-4484; e-mail <boops@juno.com>; web: <www.flash.net/~ lcarc>. (Exams)

Sept. 18, **Clear Lake ARC Swapfest '99**, Webster Civic Center, **Webster, TX**. Contact Bob Biekert, KA5GLX, P.O. Box 57714, Webster, TX 77598; e-mail: <ka5glx@clarc.org>.

Sept. 18, **Southeastern Massachusetts Fleamarket**, Marshfield Fairgrounds, **Plymouth, MA**. Contact Lou Vanderstreet, N1WNT, 781-837-6651; e-mail: <n1wnt@mediaone.net>. (Exams)

Sept. 18, **Southern Kentucky Hamfest**, Cave City Convention Center, **Cave City, KY**. Contact Larry Brumett, KN4IV, 108 Withers Drive, Glasgow, KY 42141(502-651-2363; e-mail: <lbrumett@glasgow-ky.com>; web: <http://www.geocities.com/CapitolHill/5421>. (Exams)

Sept. 18, **Buffalo Hamfest/ARRL Western NY**

(Continued on page 30)

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25 Newbridge Road
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Results of the 1998 CQ WW DX SSB Contest

BY BOB COX*, K3EST

With high expectations of the start of the new cycle, contesters from around the world were prepared for a weekend of great fun and propagation. Hundreds of contesters left the warm comfort of their homes to head for greener pastures. From beginners to seasoned veterans.

The new cycle began by giving 15 meters back in a big way. Ten meters returned but was still the little sister to 15 meters. Overall the conditions were great for most of the world and the bands were alive with signals. Many records fell. However, as the comments in the "QRM" testify, contesters from the British Isles to The Netherlands experienced gale-like conditions and Scandinavia seemed to be in a Faraday cage. Look at the 10-meter and 15-meter QSO totals and you will see what difference a year makes. With 3,540 SSB logs received, the 1998 DX contest turns out to be the largest reported DX contest in history. With hundreds of people getting on planes, into cars, or on boats and heading off to some exotic QTH, the number of countries available to the contester and DXer soared to 230. So read on and see how everyone did and make your plans now to join in the great contest party: The 1999 CQ WW.

Joint strategy session for B1A/B1Z groups. Left to right: BA1DU, BA1KA, BA1FB, OH2KI, BA1AJ, OH2PM, OH6LI, OH2BH, BG1SUN, BG1BF, BZ4DCH, BD1CM, OH2TA, BA1RB, and BZ1OM.

High Power

The all-band competitors sure like to travel. Of all the top ten scores, only one was operating from his own shack. We all owe a special debt of gratitude to these intrepid travelers. They fill up the bands with their excellence and enthusiasm.

The competition for first and second was the closest in years. Operating just south of the equator on either side of South America, Rich, HC8A (N6KT) and Jim, PTØF (N5FA), went all out to take advantage of the improving conditions. Both had arrived in their respective QTH's well before the contest. When the final bell rang, top world honors were garnered by Rich, HC8A. Making nearly 9,000 QSOs is a lot of fast talking. Jim was very close behind. On his first solo all-band effort, he sure made a big splash with an outstanding multiplier. Rich's effort was also enough to set a new all-time World All Band record. Congratulations to both. Third place and first place in Africa with a new African record was Bernd, DL6FBL, who put CN8WW on the map. Bernd just edged out Pekka, EA8AH (OH1RY).

As they say in real estate: location, location. And Robert, GIØKOW sure has a good QTH. But the story doesn't end there. He also has put a lot of work into building a very competitive station. Coupled with his operating skills, he took the top spot in Europe. Second place went to Harry, RA3AUU, who traveled over to Belgium and put OT8T (ON4UN's QTH) into many logs. Third place was won by perennial high finisher: 4N9BW.

The U.S. top spot was again claimed by John, K1AR, operating at K1EA. It seems that you might be able to hear Europeans at that QTH without antennas! It sure plays and, with a maestro like John at the wheel, it is tough to beat. Second place honors go to Tom, W2SC, who traveled from Kansas to operate from K5ZD/1. Third place was Bill, W4AN. Bill has built his station up to the point that he can really make it play. There is a big satisfaction in seeing something you made really work. Three zone 4 stations made the top ten. Steve, N2IC/Ø did a fantastic job from out in Colorado edging out Mike, W9RE. Jim, N3BB/5, put Texas in the top ten for the first time in a while.

Low Power

Taking time off from his photography business in Quito, Pedro, HC1OT, decided to see what he could do in the low power category. What he could do turned out to be the #1 score in the world by a large margin. Pedro also set the all time South American Low Power record. About 4,000 miles to the northwest, Dale, XL7A (VE7SV), was also entering the LP category. When the dust settled, he had secured second place world over YS1RR. Special mention should be made of the outstanding job done by Jacky, E31AA (F2CW). He put a new country in a lot of logs.

As always the competition in Europe is fierce in the Low Power category, so to

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W4BVV Memorial

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Donor: Gordon Marshall, W6RR

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Horacio Botero, HK6KKK
Donor: Jose L. Bachmann, ZP6CC
& Cesar Ivaldi, ZP5K

SINGLE OPERATOR, SINGLE BAND
World—28 MHz
ZX5J (Opr. Sergio Lima de Almeida, PP5JR)
Donor: Joel Chalmers, KG6DX

World—21 MHz
9J2A (Opr. Akira Minagawa, JAØJHA)
Donor: Robert Naumann, N5NJ
World—14 MHz
8R1K (Opr. Marko Myllymaki, N5ZO)
Donor: North Jersey DX Assn.
K2HLB Memorial

World—7 MHz
IG9T (Opr. Alberto Annesi, IV3TAN)
Donor: Fred Laun, K3ZO
K7ZZ Memorial

World—3.7 MHz
IG9T (Opr. Antonio D. Asta, IT9EQO)
Donor: Fred Capossela, K6SSS

World—1.8 MHz
VE1BY (Opr. Yuri Blanarovich, K3BU)
Donor: Robert Wruble, W7GG

USA—28 MHz
Chuck Dietz, KZ5MM
Donor: Donald Thomas, N6DT

USA—21 MHz
WØUN (Opr. George Schultz, WØUA)
Donor: David Hueben, KBØISS

USA—14 MHz
Daniel Handa, W7WA
Donor: Southern California DX Club

USA—7 MHz
Steven R. Kelly, K7EM
Donor: Stanley Cohen, W8QDQ

USA—3.7 MHz
K1FZ (Opr. Lawrence F. Emery, K1UO)
Donor: Arnold Tamchin, W2HCW

USA—1.8 MHz
Wallace Eccles, W8LRL
Donor: CQ Magazine

Carib./C.A.(28 MHz)
Richard Zalewski, XE2DV
Donor: Snake River Contest Club

Europe—28 MHz
9HØA (Opr. Jeff Morris, 9H1EL)
Donor: Chod Harris, VP2ML

Europe—21 MHz
Zdravko Balen, 9A9A
Donor: Tine Brajnik, S5ØA

Europe—14 MHz
Wilfried Gottschald, DJ7AA
Donor: A. G. Anderson, GM3BCL

Europe—7 MHz
9A5Y (Opr. Ozren Niksic, 9A7W)
Donor: Roger Burt, N4ZC

Europe—3.7 MHz
Tine Brajnik, S5ØA
Donor: Marconi Contest Club
I3MAU Memorial

Europe—1.8 MHz
Virgis Matizevicius, LY3BS
Donor: Robert Kasca, S53R

Oceania (21 MHz)
9M8R (Opr. Jim Sullivan, W7EJ)
Donor: Bruce D. Lee, KD6WW

Japan—21 MHz
Tom A. Tatomi, JA5OVU
Donor: DX Family Foundation

Japan—14 MHz
Hiro Shiozawa, 7L1GVE
Donor: Take Yokoyama, JL1BLW

MULTI-OPERATOR
SINGLE TRANSMITTER
World
C56T (Oprs: DL5NAM, DF4RD, OE2VEL, DL8UD, OE2MON, DL9NDS)
Donor: Southern California DX Club
W6AM Memorial

U.S.A.
KC1XX (Oprs: KC1XX, KM3T, K1GQ, K1DG, KC1F, AD1C)
Donor: Carolina DX Association

Carib./C.A.
FG5BG (Oprs: N6RV, W6SR, N6ED, K6RO, W6KK, N6RT)
Donor: Eric Scace, K3NA

Africa
EA8ZS (Oprs: EA8ZS, EA8KK, EA8PP, EA8BYL, EA8AM, EA8BTA, EA3ELM, EA2KL)
Donor: CQ Magazine

Asia
UPØL (Oprs: UN9LW, UN7LZ, UNØLW, UN7LAN)
Donor: Edward L. Campbell, AH2BE

Europe
TM2Y (Oprs: F6ARC, F6BEE, F6FGZ, F5MUX, F5NLY, F5SNJ, F9IE)
Donor: Bob Cox, K3EST

Oceania
T32MP (Oprs: KØMP, NØKV, WØNF, AE7C)
Donor: Junichi Tanaka, JH4RHF

South America
9Y4NW (Oprs: DK6WL, DL4MCF, DL4MDO, DL4MEH)
Donor: Victor Burns, KI6IM

South America—Mainland
CE3F (Oprs: SM3SGP, CE3FIP)
Donor: Tomas Zappini, ZP5AZL &
Renato Bellucci, ZP5XF

MULTI-OPERATOR
MULTI-TRANSMITTER
World
PJ9B (Oprs: K1XX, K2SS, K3EST, K3MM, KB2XZ, KL2A, N3ED, N6IG, W3UM, WA3LRO)
Donor: Dave, W6NL and Barb, K6BL Leeson

U.S.A.
K3LR (Oprs: K3LR, N3RA, W3GH, ND8L, K8GL, K9VV, K5TR, K8CX, K3UA, XE2AC, W8JV, KA3JWJ)
Donor: Paul Hellenberg, K4JA

Europe
M8T (Oprs: G4BAH, G3XTT, G3WGN, OH6YF, G4VMM, GØCYB, G4BUO, G4TSH, G4JVG, G4PIQ, G4BWP, GØAEV, GØKRL, GØWCW, GØOZS, G3PJT, GØHSS, GØAFH)
Donor: Finnish Amateur Radio League

Japan
JA5BJC (Oprs: JA5BJC, JA5FDJ, JA5JCC, JA5THU, JH5FXP, JH5RXS, JR5JAQ, JR5VHU)
Donor: Ryozo Goto, JH3JYS

CONTEST EXPEDITIONS
World Single Operator
E31AA (Opr. Jacky Calvo, F2CW)
Donor: Capitol DX Association
Stuart Meyer, W2GHK Memorial

World Multi-Single
C56T (Oprs: DL5NAM,DF4RD,OE2VEL, DL8UD, OE2MON, DL9NDS)
Donor: Tachio Yuasa, JA9VDA

World Multi-Multi
T88X (Ops: JA6VZB, JA1WSX, JF1MIA, JR6IQI, JQ6GDP, JHØXUP/6, JE2PCY)
Donor: Dieter Loffler, DK9KD
DJ3NG & DJ4EI Memorial

SPECIAL EVENT AWARD
Chinese Radio Sports Association
B1A, B1Z, B4R, B7K
Donor: CQ Contest Magazine

SPECIAL SINGLE OPERATOR AWARDS
World-All Band Under 21 years old
Hamilton Oliveira Martins, PY2XE
Donor: Gene Zimmerman, W3ZZ

World All Band High YL
Emily Thiel, P43E
Donor: Yutaka Tanaka, JH3DPB
KA6V Memorial

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end up on top is a real accomplishment. That position goes to Peter, DL2NBU. His UBN was one of the best in the world with a log with very few errors in it. Second place went to Gediminas (LY3BA) using the special call LY63BA. The "bronze medal" goes to T99W. The winners are more or less N/S in central Europe.

In the SOABLP USA category, it was Ann, WA1S, easily coming out on top with over 1.5M. This is Ann's second major win in a row, establishing her as a force to be reckoned with. Ann starting dabbling in this category several years ago and was "surprised" when she made the top ten "without really trying." Now that she is more serious about her effort, you can see that it is really paying off! Low Power (in terms of raw numbers of entrants) is THE MOST competitive category in the CQWW.

Second place goes to Fred, NA2U, with just under 1.3M. Fred is another example of a contester who just keeps trying and keeps getting better and better. This is his best place of finish since he started entering this category. He has steadily built up his station and antennas (which are still quite modest by most standards). A great effort Fred; hang in there! Right behind Fred is K1VUT with 1.2M. And the perennial West Coast Top Ten guy makes it again. WA7BNM/7 finishes in 5th place with just over 1M. Great job on those contest calendars, too!

QRP

The QRP category was a big surprise this year. Finishing FIRST IN THE WORLD with 612k is N6MU. Not only is this the first time that a West Coast station has won QRP for the U.S, it is also a first for winning the world—WOW! John (who operated from N6NB's qth at 7,000 feet elevation) has been very active in contesting recently. Told that he had achieved "a coup" in the CQWW, he modestly stated that it was due to a lack of participation by VE3KZ and KR2Q. Come on, John, take your bow! You deserve it!

Second in the world with 575k is another familiar face: YU1KN. Representing the East Coast U.S. and in third place for the world is K2PS with 525k. Fourth place world goes to LU1VK with 518k while the sixth place world finisher was taken by JR4DAH with 419k. It's really exciting to see the top six slots distributed over four continents.

Assisted

The World Assisted class was topped by Jeff, K1ZM. Operating from his new QTH on Cape Cod, Jeff showed everyone how it is done. Second and third place went to last year's one and two. This year, TM2V, operated by F6GYT, outdistanced Roland, DK3GI, at club station DLØWW.

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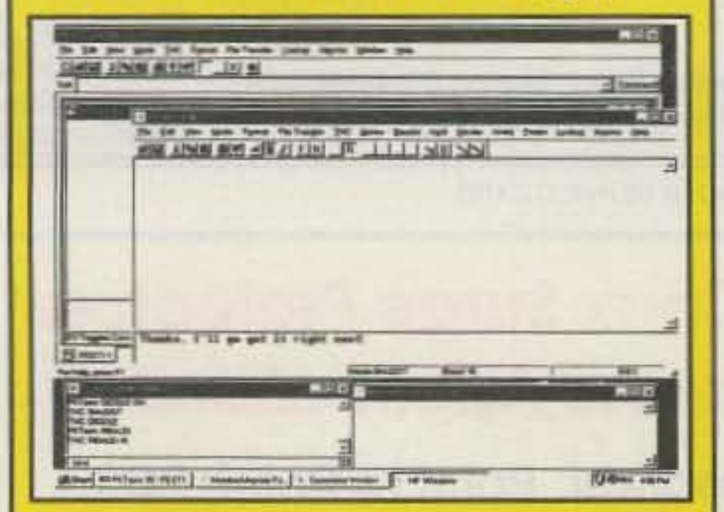

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TEAM CONTESTING

1. Neiger's Tigers Team #1: 63,665,482. By CN8WW (DL6FBL), SU2MT (CT1BOH), ZD8Z (N6TJ), EA9AM (K6NA), P4ØW (W2GD).
2. Contest Club Finland #1: 28,987,393. By OHØZ (OH1EH), CP6AA (OHØXX), EA8AH (OH1RY), 8R1K (N5ZO), 8P9V (OH6RX).
3. Contesting.com: 22,033,083. By N2IC/Ø, K4AB, W4AN, AA4S, PJ8Z (K4ZA).
4. Yugoslavian Contest Team: 19,145,024. By 4N9BW, 3V8BB (YT1AD), YT1AD (YU1DX).
5. Team Aruba: 18,954,500. By P43A, P43E, P43T, P43W, P4ØB (P43P).
6. Neiger's Tigers Team #2: 17,230,198. By W1WEF, W9RE, WB9Z, V47KP (W2OX), GW4BLE.
7. Crazy German Contesting Gang: 14,828,884. By A61AC (DL2CC), DLØWW (DK3GI), DL3NCI, DL4NAC, DL6MHW.
8. Neiger's Tigers Team #3: 5,043,999. By P4ØN (W5AJ), CT1ELP, NA2U, TL5A (PA3DZN), K3BYV.
9. Don Darias Contest Team: 4,665,198. By GM8V, GM4AFF, GM4YXI, GWØGEI.
10. ZA-TE Plus Team: 3,939,736. By 9A/WA4IMC, 9A9A, 9A6A, 9A7R, 9A2EU.
11. Yugoslavian Single Band Team: 2,271,389. By 4N7B, YT1BB, YU1JW, YT1R.
12. Labre-SP Contest Team: 2,296,032. By PQ2A, PY2XE, PY2KP.
13. Team Tennessee: 1,863,861. By KF4ZR, N4KN, NN4T, NY4T, WO4O.
14. Contest Club Finland #2: 1,620.590. OH2LU, OH6NIO, OH8BQT.
15. TuPY TEAM #1: 895,661. By PR2W (PT2AW), PY2NY, PY2KQ, PY2APQ.
***16. TuPY TEAM #2: 847,985.** By PY2ELG, PY2TI, PY2XE.
***17. DX Cachafaz's Team: 669,052.** By LU4HUG, LU5HY, LU9HOA, LW5HBR, LW6HAR.
18. Contest Club Finland #3: 623,804. By OH3WW, OH5BM.
***19. Old Friend's Team: 453,603.** By S57CQ, S57DX, S58WW.
***20. Northern Greece Contest Team: 433,432.** By SV2CWY, SV2BFN, SV2AEL.

** All Team Low Power*

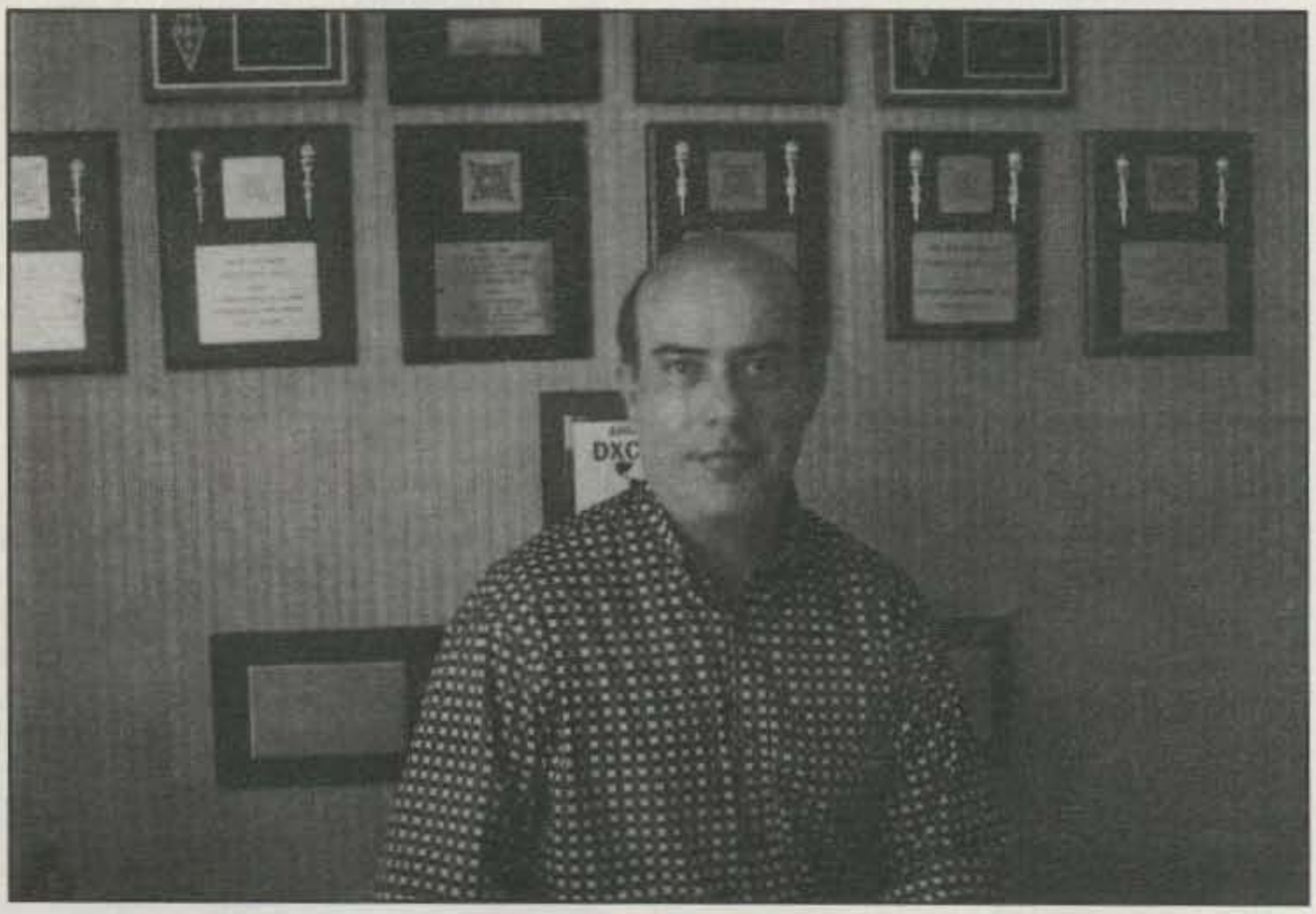
Roland continues to get a great multiplier. Allowing Barbados to break into the top ten for the first time was 8P6SH. With the spread of the Internet, gateways into packet systems around the world have all but eliminated packet isolation. Second behind K1ZM in the U.S. and fourth in the world was KI1G. Third place was taken by Charlie, K3WW, who gave his best for the FRC.

Once again our log-checking found several instances where stations lost points because QSOs were logged on the wrong band. Apparently some operators lose track of their band changes at times. And again some entrants lost QSOs by grabbing packet announcements and logging the announced callsign without listening to verify the call. The call may be wrong on packet.

Multi-Single

Putting together a world class multi-single operation requires a lot of planning. A lot of groups put in the effort in 1998. Jumping on a plane and heading out to DX locations were dozens of expeditions.

The world's top MS score was a DXpedition by the Bavarian Contest Club,



Pedro Katz, HC1OT, #1 World Low Power.

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TOP SCORES IN VERY ACTIVE ZONES

ZONE 3

*XL7A	3,513,342
W7AT	2,838,786
WC6H	2,699,175
W7GG	2,512,806
K7RI	2,150,582
N7TT	2,082,483
K6GX	1,776,620
VE7IN	1,462,734
KI6CG	1,276,560
*WA7BNM/7	1,097,250

ZONE 4

N2IC/Ø	3,777,672
W9RE	3,588,312
WB9Z	3,028,104
KØRF	2,926,228
K4AB	2,747,136
K9BGL	1,414,992
VE3XN	1,340,180
VE3AT	1,334,377
W5MN	1,272,503
W5WMU	1,164,908

ZONE 5

K1AR	5,952,375
K5ZD/1	5,481,048
W4AN	4,989,960
K3ZO	3,815,240
N2LT	3,572,140
W3BGN	3,401,478
N3BB/5	3,232,413
K2DM	3,068,044
W1WEF	2,819,586
VE1JX	2,870,952

ZONE 14

GIØKOW	7,388,788
OT8T	6,791,449
GW4BLE	4,520,836
DL4NAC	4,395,584
DJ4PT	3,452,766
F5NBX	2,965,933
*DL2NBU	2,049,057
GØIVZ	1,717,760
DJ6QT	1,633,980
DL8PC	1,574,056

ZONE 15

4N9BW	5,240,144
OK1RI	4,838,015
OHØZ	3,742,508
YT1AD	3,023,440
LY5W	1,905,260
YZ7AA	1,838,467
*LY63BA	1,707,480
IK4ADE	1,705,088
IZ8Z	1,695,172
*T99W	1,653,300

ZONE 25

JAØQNJ	3,093,912
JA8RWU	2,673,128
JS3CTQ	2,211,638
JM1XCW	1,720,383
JA7BEW	1,504,128
*JL1ARF	1,238,204
JAØQWO	989,080
JH4ADK	978,193
JA2BNN	922,610
*JEØUXR	911,616

** Low Power*

ZONE LEADERS SINGLE OPERATOR

Zone	Call	Score	Zone	Call	Score
1	KL7AC	772,310	21	A61AC	5,424,530
2	*VE2GSO	546,096	22	*ATØMB	803,665
3	*XL7A	3,513,342	23	*UAØYAY	344,311
4	N2IC/Ø	3,777,672	24	VR98BG	795,511
5	K1AR	5,952,375	25	JAØQNJ	3,093,912
6	*XE2DV	1,052,625	26	3W6US	538,450
7	*YS1RR	2,761,850	27	KHØI	3,506,976
8	PJ8Z	8,591,520	28	9M6AAC	8,710,746
9	P4ØW	14,020,064	29	No Entry	
10	HC8A	17,055,106	30	VK5GN	2,282,132
11	PTØF	16,519,026	31	NH7A	4,393,940
12	XR3M	1,338,350	32	FK8HC	1,505,160
13	LU1HLH	2,664,288	33	CN8WW	15,375,060
14	GIØKOW	7,388,788	34	SU2MT	11,805,734
15	4N9BW	5,240,144	35	6V1C	1,623,378
16	RW4AA	2,778,560	36	ZD8Z	13,715,460
17	EX8W	4,020,525	37	*E31AA	2,589,816
18	RZ9UA	1,211,679	38	ZS6BXN	2,529,660
19	*UAØJH	972,036	39	*FR/DL5JMN	28,714
20	C4A	9,781,930	40	*TF8GX	254,775

** Low Power*

SINGLE OPERATOR MAX BOX

	QSOs			DXCC	
ZX5J	28	5392	ZX5J	28	183
9J2A	21	5411	ZX9A	21	180
8R1K	14	3469	DJ7AA	14	174
IG9T	7	2128	4N7B	14	174
S50A	3.7	1689	9A5Y	7	135
LY3BS	1.8	1222	S50A	3.7	117
			SV8CS	1.8	77

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21 MHz: OE6Z (Opr. OE6MBG), SP5GRM, 9A9A, OM7M (Opr. OM5RW), 9J2A (Opr. JAØJHA).
14 MHz: II3T (Opr. IV3YYK), EA3ATM, K4XS, YO4NF, GM8V (Opr. GM3WOJ), IT9STX, VE7XR, SN2B (Opr. SP2FAX), RZ9UA.

JA6ZPR, all in WW T-shirts. Left to right: JH6ETS, JR6CKX, JR6HVE, JH6JSR, JR6HLR, JH6SQI.

C56T. The group not only took top world honors but set a new African record along the way. Close behind was another Bavarian Contest Club DXpedition to 9Y4NW. It is wonderful to see the BCC getting in on the fun and handing out multipliers to the deserving from exotic QTHs. Third place goes to FG5BG. They talked their way from a 2 point area into 3rd World high.

The surprise was in Europe, where the extremely accurate log of TM2Y took top honors from F6BEE's country house. Their log is a perfect example of taking the time to get calls right before you log them. Second in the hotly contested European MS category was the IR4T team operating from their shack 150 feet in the air in a water tower! I guess they bring their own ground with them. Third place goes to the famous Hungarian station, HG1S, operating from southern HA-land.

Taking a year off from MM competition, Matt, KC1XX, put together a fine crew. With his great antenna farm and towers, they vaulted far ahead of the pack to take top USA honors. Standing alone in second place was the Frankford Radio Club station, N2NU. The real close battle was for third through sixth place. K4ISV took third. Much further west and in the thick of the battle was W9JA (now K4JA).

Multi-Multi

The crew at PJ9B once again won the Multi-Multi category. This time with the second highest score ever. They came within 3.6 million of their all-time 57.6 million point score. Their crew had no idea that they would come as close as they did to the record and were as surprised as

(Continued on page 72)

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HISTORY

September 30th marks the 100th anniversary of Marconi's first radio transmission in America. Here W2OD brings us the transcript of a recording of the words of Marconi's daughter concerning this historic event, some of the technical considerations of that first transmission, and an overview of a few of the special events that will take place.

Marconi—A Man of Vision

The 100th Anniversary of the First Wireless Transmission in America

BY BOB BUUS*, W2OD

Author's Note: The following is a transcript of the recording that may be played at the audio station near the North Tower of the Twin Lights Historic Lighthouse in Highlands, NJ. This is the site of Marconi's 1899 receiving station, which received the first wireless message in America. Marconi's daughter, Gioia Marconi Braga, who died a few years ago, made the recording.

First Wireless in America

By Gioia Marconi Braga

My name is Gioia Marconi Braga, and Guglielmo Marconi, the inventor of the wireless telegraph, was my father. I would like to take you back to the events of September and October 1899 and tell you the story of the first demonstration of practical wireless telegraphy to take place in America.

My father was invited to America by James Gordon Bennett, the publisher of the *New York Herald* newspaper, to publicize the 1899 America's Cup Races and to demonstrate the wireless telegraph. The contenders in the race were the British yacht *Shamrock*, owned by Sir Thomas Lipton of Lipton tea fame, and the American yacht *Columbia II*, owned by financier J. P. Morgan.

Marconi traveled from England on the Cunard liner *Aurania* and arrived in New York on September 21, 1899. For the reporters sent to meet him at the dock, he had a prepared statement, half-confident, half-defiant. It said, "We will be able to send the details of the yacht racing to New York as accurately and as quickly as if you could telephone them. The distance is nothing."

At the Twin Lights beacon on the bluff of the Navesink Highlands, Marconi's assistant, William Bradfield, got the receiving mast in position (*the concrete guy anchors can still be seen in the lawn just north of the North Tower—W2OD*) and explained patiently its purpose to the lighthouse keepers and signal servicemen on the reservation. They listened silently, spat meditatively, and looked at him as if he had lost his mind. When Bradfield installed sending instruments on the *Ponce* and sea-going steamer *Grande Duchesse* chartered to follow the races, the crews accepted his intrusion with the solidity of seamen everywhere.

Before the America's Cup Races could begin, however, Commodore George Dewey returned victorious from the Battle of Manila Bay in the Spanish-American War and a great naval review was planned by President Theodore Roosevelt to celebrate the victory. The yacht races were temporarily postponed, and on September 30, 1899, the first wireless messages were sent to report on the progress of Commodore Dewey on the flagship *Olympia* and the United States Navy's Great White Fleet of cruisers and battleships as they steamed up the Hudson River. (*The Olympia can be visited as a floating museum in Philadelphia.—W2OD*) These transmissions were the first demonstration of practical wireless telegraphy in our history.

In the middle of October, the naval review over, the America's Cup was moved into the news. Marconi's first message served no nautical purpose and was sent only to silence scoffers. It proved that the racecourse off the spit of Sandy Hook was one minute by wireless from Herald Square in New York.

On October 16th, the races and the transmitting began in earnest. At a rate of 15 words per minute (*The official transcript at the Twin Lights State Historic Site says 50 words per minute, but we believe that this is a transcription error.—W2OD*), still considered miraculously rapid, he sent 2500 words from the *Grande Duchesse* as she trailed the *Shamrock* and the *Columbia* on their course 15 miles out from the Sandy Hook Lightship and 15 miles back.

By the end of the second day, when the American yacht *Columbia* beat the British yacht *Shamrock* roundly in a period of less than five hours, more than 5000 words had been consigned to the air and received by telegraph at the *Herald* office in New York City, where they were reprinted in the paper and posted on bulletins in the windows. Bennett was moved to editorialize, "The possibilities contained in the development of telegraphy without wires are so important that any step tending to bring this system before the public and show what it is capable of accomplishing in a commercial way must be of interest not only to those interested in science, but also to anyone who wants to send a telegram." Within a few years, a wireless telegraph, known simply as a "Marconi," was required on all sea-going ships and was responsible for saving many lives at sea, including 705 survivors of the *Titanic*.

For Sir Thomas Lipton in that October, there was failure and popularity; for Dewey, a house in Washington presented by a grateful country; for Marconi, a newspaper accolade. Marconi was a national hero! Barely two-and-a-half years later, father reached perhaps the crowning point of his career, the successful transmission of a wireless signal from England to America. The feat prompted Thomas Edison to remark, "I would like to meet that young man who had the monumental audacity to attempt and to succeed in jumping an electrical wave across the Atlantic."

What other men had been content to prove impossible, he accomplished, and this is truly greatness. The history of wireless communication has been a history of miracles. To Marconi's vision and perseverance, we owe the immeasurable benefits of radio and all that stems from it.

*8 Donner Street, Holmdel, NJ 07733; e-mail: <w2od@aol.com>

The Twin Lights Lighthouse/Museum of Highlands, New Jersey. Marconi's vertical receiving antenna was located just beyond the light tower on the right. This site on a high bluff overlooking Sandy Hook and lower New York harbor was the receiving site for the first practical radio transmissions in America. (Painting by Lola Adolph, Atlantic Highlands, New Jersey)

This first wireless system to report on the America's Cup races was apparently a one-way system. That is, the monitoring ships were equipped with transmitters but no receivers. Similarly, the Twin Lights site was equipped with a receiver but no transmitter. Thus, the ships sent their reports "blind" and assumed that the shore station at Twin Lights had solid copy.

Marconi had enough experience with his wireless to know that the distance covered (about 15 miles) would give a reliable signal at the receiver for the spark transmitter that he had installed on each ship. The only potential problem would be if both ships transmitted at the same time. The receiver at Twin Lights would hear both simultaneously and not be able to copy either one.

Obviously, there had to be some means to assure that only one ship transmitted at one time. Perhaps they took turns at assigned times or maybe they communicated between ships with flags or blinker lights to acknowledge which one was transmitting at any given time. Since Marconi had a lifelong preoccupation with time and timekeeping, chances are the transmissions were scheduled by time.

Apparently, radio pioneer Reginald Fessenden played a role, as reported in *Marconi* by W. P. Jolly (Stein and Day, 1972, p. 79): "In November 1899 Professor Fessenden opened a discussion on wireless telegraphy before the American Institute of Electrical Engineers in New York. He revealed that it was he who suggested to one of the editors of the *New York Herald* that they report the international yacht races by wireless. When the suggestion was adopted, Fessenden himself was invited, in December 1898, to undertake the work, but he declined and put the newspaper in touch with Marconi."

Also, it was reported that Twin Lights was not the only receiving station. A cable ship tied up in New York harbor also copied the reports from Marconi's transmitters and relayed them to Europe on a connected transatlantic cable. Obviously, anyone with a receiver in the New York area would have been able to copy the messages coming from the two ships. I'm surprised that rival newspapers didn't press some local radio experimenters into copying the transmissions.

The Marconi Spark Transmitter

The Marconi spark transmitter of 100 years ago was a simple, untuned spark transmitter using the Rhumkorff coil to produce high-voltage spikes from a low-voltage DC battery supply as shown in fig. 1. When the Morse key is closed, current flows from the battery through the primary of the Rhumkorff coil and the closed interrupter. As the current builds up (remember that an inductor opposes any sudden change in current, so it will take a little time for the current to build up), the iron core of the coil becomes magnetized and attracts the iron armature of the interrupter. This suddenly breaks the current to the primary, and the collapsing magnetic field induces a large counter-voltage across the primary coil. Typically, this voltage spike is several hundred volts even though the battery voltage is only about 10 or 12 volts.

Since the secondary typically has about 100 times as many turns as the primary,

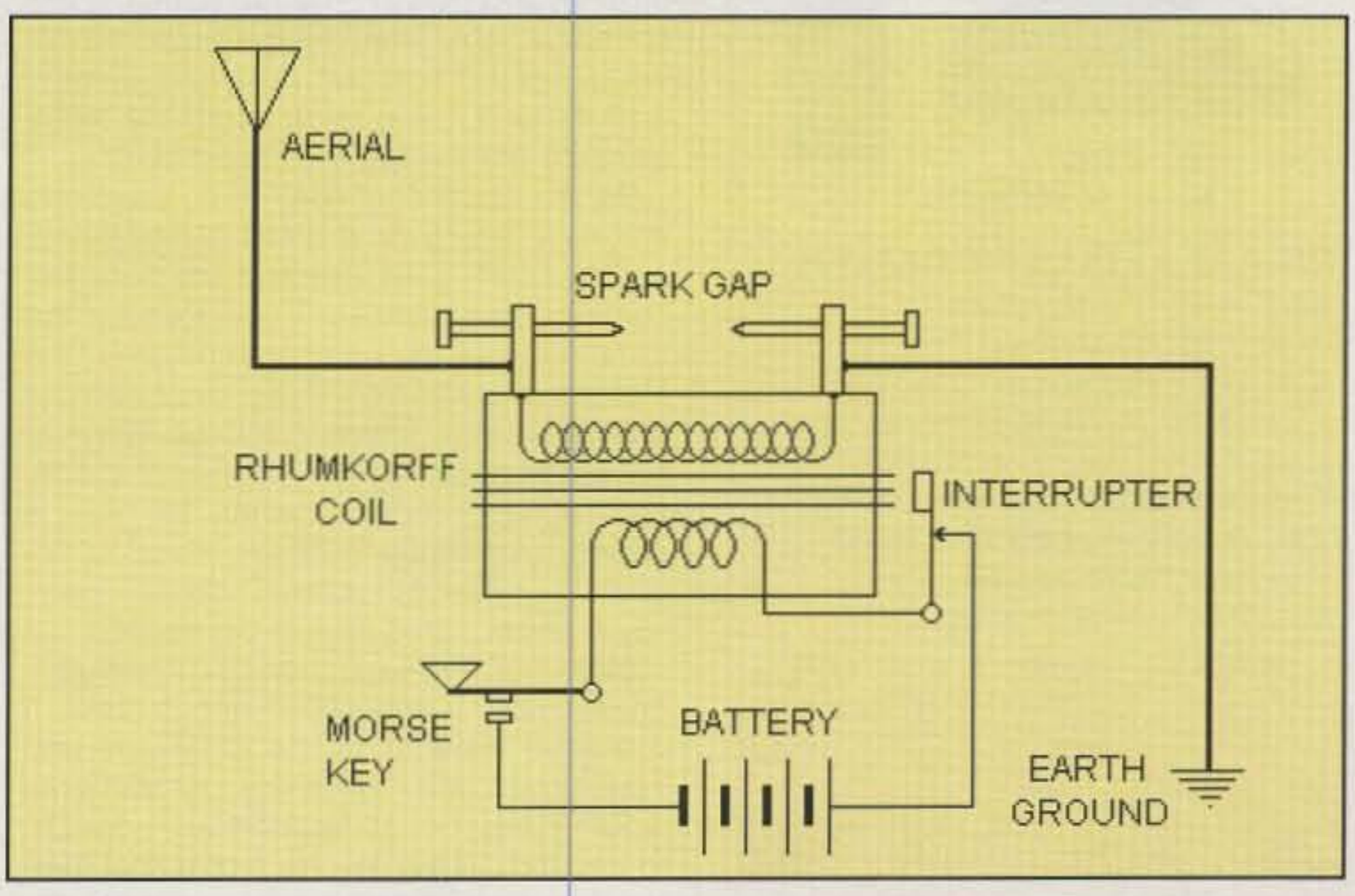

Fig. 1– Schematic diagram of the spark transmitter used to send America's Cup race information to shore. Not shown is a capacitor placed across the interrupter contacts to reduce arcing and pitting.

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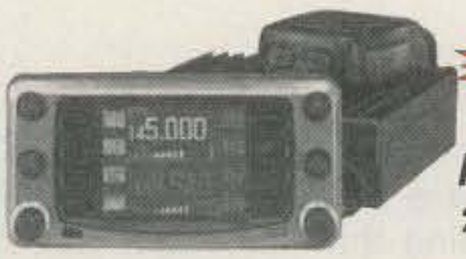

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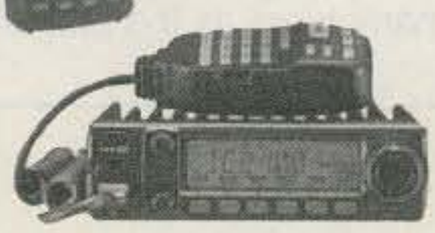

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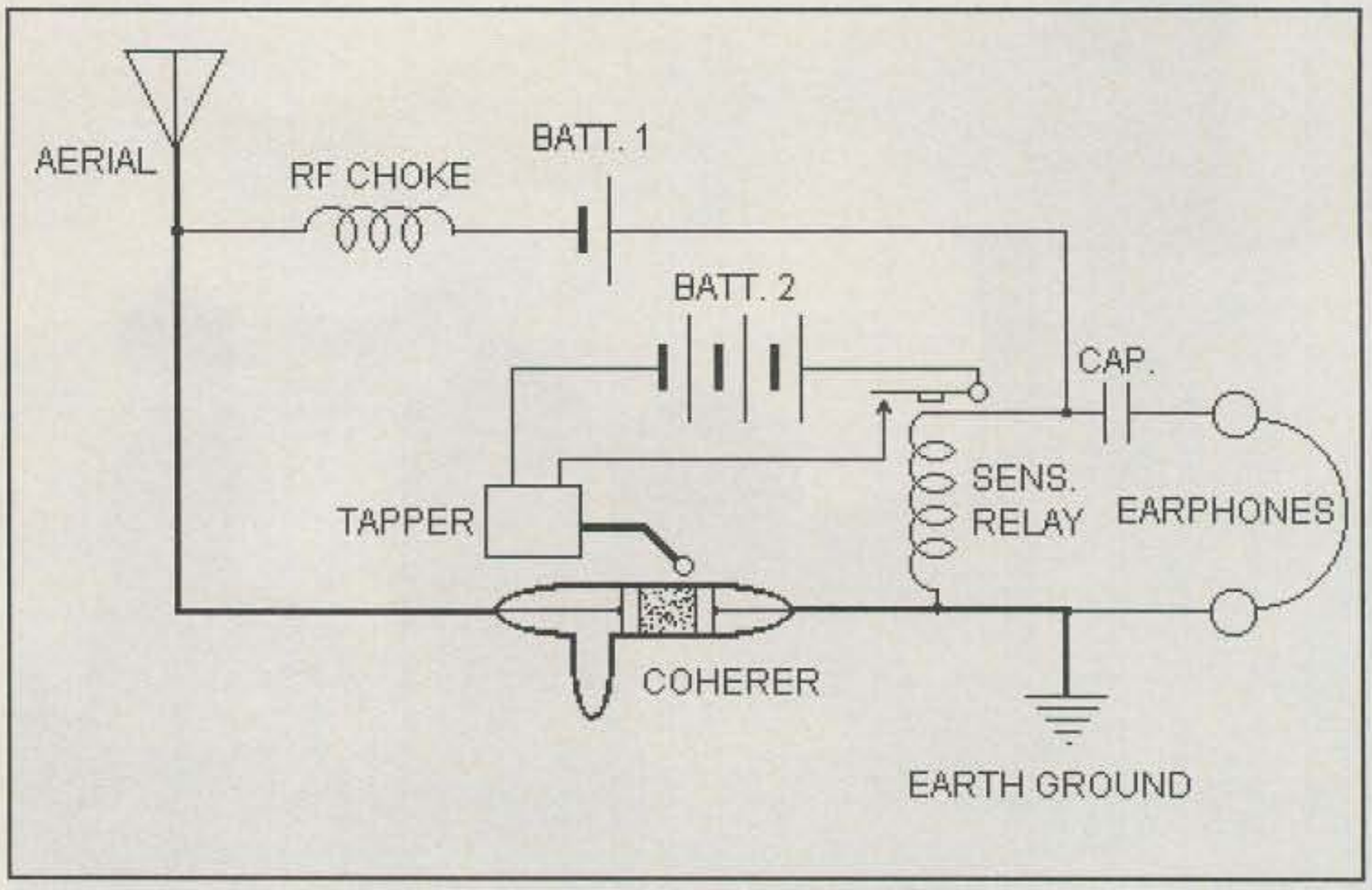

Fig. 2– Schematic diagram of the coherer receiver used at Twin Lights to receive the America's Cup race results, which were then relayed by land-line telegraph to the New York Herald *newspaper. The coherer became and stayed a low resistance every time a burst of energy was received on the aerial. The tapper mechanically loosened the particles in the coherer between RF pulses to re-establish a high resistance.*

the voltage spike is stepped up by the turns ratio, so the spike across the spark gap will be many tens of thousands of volts. This voltage spike starts propagating up the antenna at nearly the speed of light. However, the high voltage at the spark gap ionizes the air in the gap, and once ionized, the air "shorts out" the high voltage so the voltage across the spark gap abruptly drops to a very low value. The charge that was propagating up the antenna now becomes a discharge, also propagating up the antenna at nearly the speed of light. This voltage pulse traveling along the antenna produces electric and magnetic waves that radiate away from the antenna at the speed of light.

As the spark continues to conduct, the magnetic energy in the coil is dissipated, so the spark goes out and the core becomes demagnetized. This releases the armature back to its rest position, and if the Morse key is still closed, the cycle repeats and generates another voltage spike to excite the antenna. The number of sparks per second produced when the key is closed is determined by the vibration frequency of the interrupter. This was generally a few hundred sparks per second.

Note that the excitation of the aerial is produced by a very short voltage spike. If the spike were of infinite amplitude and zero width, the frequency components would consist of all frequencies from DC to beyond ultraviolet! As a practical matter, the voltage spike has some narrow width due to the ionization time for the air gap, and although the voltage is large, it is not infinite. The resulting spike has a frequency spectrum that falls off with frequency, but significant energy extends out to several hundred megaHertz. The dimensions of the antenna determine the frequency of maximum radiated energy.

No information is available about the shipboard antenna, but it probably consisted of a wire strung between two masts with a vertical wire dropping down from the center to the spark gap. The result was a top-loaded vertical the resonant frequency of which is determined by the length of the vertical wire and the length of the capacitive top hat. A typical antenna might resonate somewhere around 2 MHz. Of course, the signal was very broad with no tuned circuits other than the antenna, so it is therefore probably safer to say that the frequency used was *everything* below 100 MHz!

By the way, Marconi used tuned circuits shortly after these tests in America. The U.S. Navy, in their request for bids for wireless apparatus, put in the condition that when there were two ships in the same general area, each had to be able to communicate with a shore station without interfering with the other. Obviously, this untuned apparatus would not meet that condition, so Marconi subsequently obtained his famous patent 7777 in 1900, which showed use of tuned circuits to narrow the bandwidth of the transmitters and receivers.

The Marconi Receiver

The receiver used by Marconi was also very simple, as shown in fig. 2. The anten-

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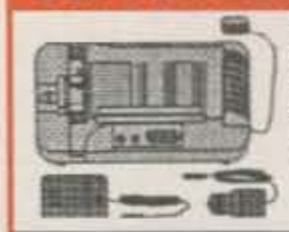

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100th Anniversary Special Events Commemorating Marconi's First Wireless Transmission in America

After reading Gioia Marconi's account of her father's first wireless activity in America 100 years ago *(see sidebar)*, it seems appropriate that the 100th anniversary be commemorated with special event amateur stations. Since many amateur clubs in the central New Jersey area expressed an interest in participating, QCWA Marconi Chapter 138 took it upon themselves to coordinate the various activities that are planned in the months September and October 1999.

WINLAB (the Wireless Information Network Laboratory) at Rutgers, the state University of New Jersey, is planning a Marconi celebration on September 30, 1999, the 100th anniversary of Marconi's first radio transmission in America. Special event station WA2GM, operated by QCWA Marconi Chapter 138, will be on the air on that day from the receiving site of 100 years ago, the Twin Lights Lighthouse/Museum.

In the first week of October 1999, the U.S. Army will officially release their ownership of Camp Evans, New Jersey. This includes the original Marconi Belmar receiving site (where Edwin Armstrong first demonstrated his regenerative receiver to David Sarnoff in 1914) and the Marconi Hotel, which provided housing for the Marconi radio operators from 1914 until 1924 (RCA took over Marconi in 1919). Ocean-Monmouth Amateur Radio Club (OMARC) will be operating special event station N2MO from the Marconi Hotel from October 4–10, 1999.

To commemorate the 100th anniversary of the America's Cup races, the Garden State Amateur Radio Association (GSARA) will operate special event station W2GSA at the Twin Lights Lighthouse from October 13–17, 1999. Hours of operation will correspond to the hours the museum is open, 0900–1700 EDST (1300– 2100 UTC).

Depending upon weather conditions (October is part of the hurricane season), we plan to have station W2OD operate from aboard a boat in New York harbor on the weekend of October 16–17.

QCWA Marconi Chapter 138 plans to operate special event station WA2GM from the Twin Lights Museum from October 20–24, 1999. Hours of operation will be the same as those for GSARA the previous week.

It is expected that other amateur radio organizations may wish to participate in this 100th anniversary celebration. For more information, contact QCWA Marconi Chapter 138 (Mike Feher, N4FS, or the author). Other organizations supporting this activity include the Italian American Association and the Information Age Learning Center.

na was directly connected to the coherer detector. For maximum efficiency, the resonant frequency of the antenna should have been about the same as that of the transmitting antenna. The antenna at Twin Lights appears to be a simple vertical with little or no top loading. Thus, it was probably somewhat longer than the vertical portion of the shipboard antennas. Judging by the guy anchors, which are still on the site, I would guess that the receiving antenna was between 100 and 200 feet high.

The receiver itself consisted of a coherer detector, a sensitive relay, a tapper, and earphones. Note that no tuned circuits were used. When the receiving antenna received sufficient electromagnetic energy, the metal particles in the coherer tended to stick together, which lowered its resistance and allowed current to flow through the sensitive relay. When the sensitive relay closed, current flowed through the tapper coil, which then pulled the tapper to rap the coherer tube. This "uncohered" the metal filings so they again became a high resistance and the receiver was set up for the next burst of electromagnetic energy. These energy bursts would come at the transmitter interrupter frequency of a few hundred times per second.

For best efficiency, it was desirable to place the mechanical frequency of the tapper in the same general range of the mechanical frequency of the Rhumkorff interrupter used at the transmitter. By capacitively coupling a pair of earphones across the sensitive relay windings, the changing voltage across the relay coil produces a nearly square-wave AC signal at the frequency of the tapper. Of course, the earphones of that day had very limited bandwidth, so the waveform reaching the operator's ear was a "rounded off" square wave. This waveform is easy to duplicate today with a square-wave generator and a low-pass audio filter.

Fig. 3(A) shows a string of voltage spikes produced by the Rhumkorff coil. Fig. 3(B) shows the resistance of the coherer. Note how each spike causes the resistance to drop to a low value and stay low until the coherer is mechanically rapped by the tapper, at which time it again becomes a high resistance. Fig. 3(C) shows the resulting AC signal appearing across the earphones.

One might wonder why the sensitive relay, which adds complexity and requires a second battery source, was needed. Why not replace the sensitive relay coil with the tapper coil in series with the headphones? Marconi had tried this previously, but he found that the battery 1 voltage had to be increased to get sufficient current to provide the good sharp "tap" needed to uncohere the coherer. When such

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AL-800
$1695
Single tube
1250 Watts

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Ameritron ALS-600 no tune Solid State base amp includes heavy duty power supply, 600 Watts out

ALS-600
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Suggested Retail

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Ameritron's 3CX1200A7 linear Amp

AL-1200
$2295
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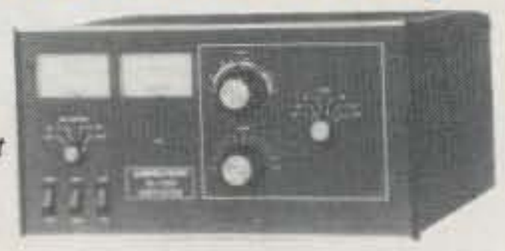

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Suggested Retail

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Oil cooled 50 ohm dummy load handles 1500 W for 5 minutes. SWR under 1.2 up to 30 MHz. Low SWR to 400 MHz.

ICP-120/240-$79

Stops power-up inrush current and absorbs momentary high voltage spikes to your amplifier. ICP-120 for 110-120V, ICP-240 for 220-240 V.

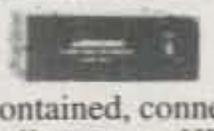
ATR-15 Legal Limit Antenna Tuner . . . $399

Designed for legal limit amplifiers! Covers 1.8-30 MHz, peak reading SWR/Wattmeter, 6 pos. antenna switch, 1:1 or 4:1 balun.

ARB-700/702 amp-to-radio interface . . 39.95

Protects your costly transceiver from damage by *keying line transients*, steady state current and excessive voltages.

QSK-5 Pin Diode T/R Switch . . . $349



Self-contained, connects externally to most HF amps. Handles 2.5 KW PEP, 2 KW CW. Six times faster than vacuum relay. 6x4x9½ in.

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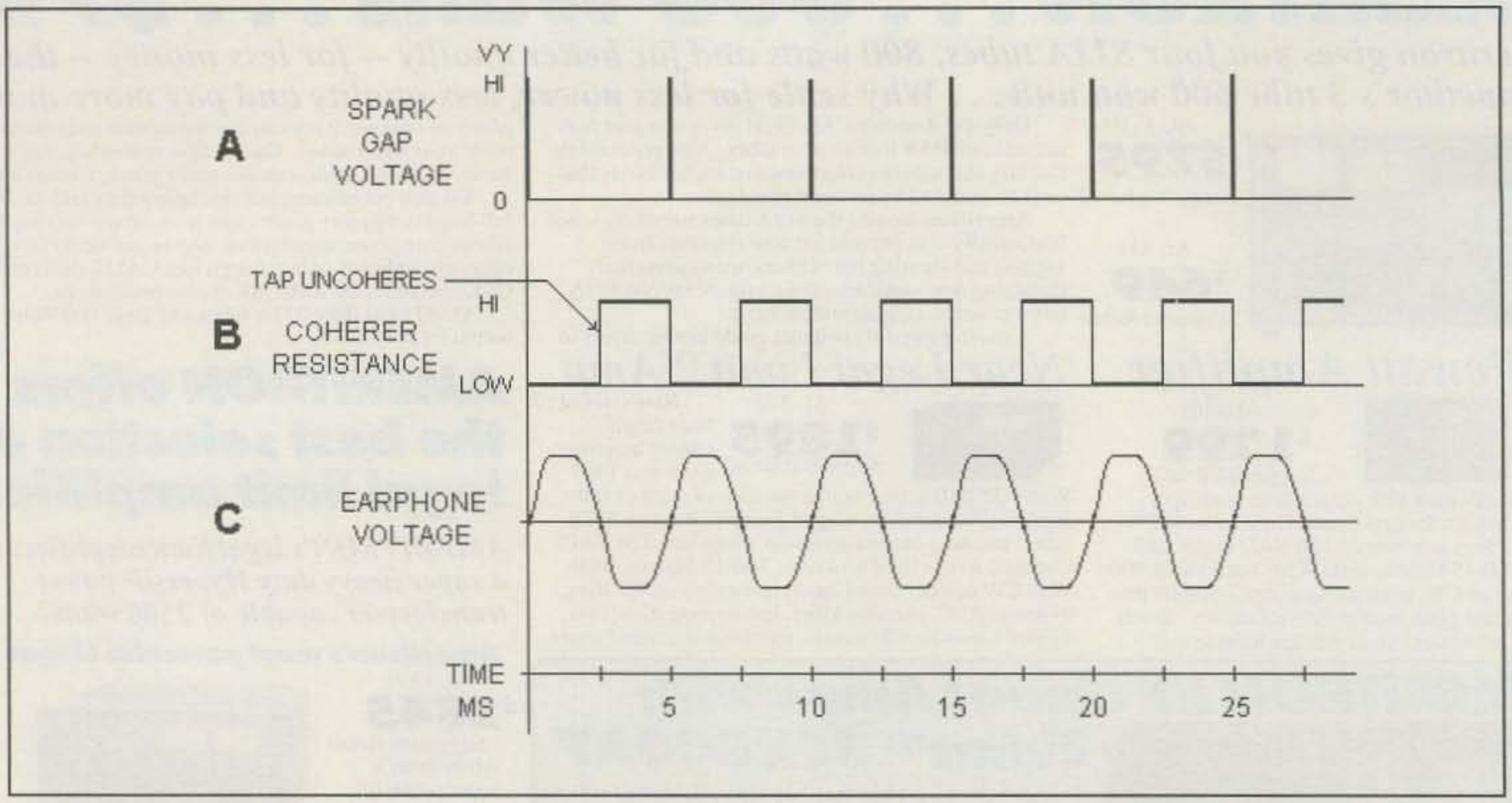

Fig. 3– Representative waveforms at various parts of the Marconi wireless system. All diagrams are on the same time scale shown at the bottom. At (A) is shown the voltage across the spark gap of the transmitter, which is near zero most of the time but spikes to many tens of thousands of volts for a short duration about 200 times per second. (B) shows the resistance of the coherer, which drops to a low value during each RF pulse but then is restored by the tapper to its unenergized high-resistance state between the RF impulses. (C) shows the voltage AC-coupled to the earphones. Instead of being a sine wave, it is a "rounded off" or distorted square wave.

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LMR 400 SOLID CCA CNTR FOIL + BRAID 2.7dB @ 450MHz WP/UV JKT	.59/FT	.57/FT	.55/FT
LMR 400 "ULTRA-FLEX" STRD BC CNTR FOIL + BRAID 3.1dB @ 450 MHz TPE JKT	.79/FT	.78/FT	.77/FT
LMR 600 (OD.590") SOLID CCA CNTR FOIL + BRAID 1.72dB @ 450 MHz WP/UV JKT	1.25/FT	1.22/FT	1.20/FT
LDF4-50A 1/2" "ANDREW® HELIAX®" 1.51dB @ 450MHz	25FT/UP	2.10/FT	

COAX (50 OHM "HF" GROUP)

	100FT/UP	500FT	1000FT
RG213/U STRD BC MIL-SPEC NC/DB/UV JACKET 1.2 dB/2500WATTS @ 30MHz	.36/FT	.34/FT	.32/FT
RG8/U STRD BC FOAM 95% BRAID UV RESISTANT JKT 0.9dB/1350WATTS @ 30MHz	.34/FT	.32/FT	.30/FT
RG8 MINI(X)95% BRAID UV RESISTANT JACKET 2.0dB/875 WATTS @ 30MHz	.15/FT	.13/FT	.12/FT
RG58/U 95% BRAID UV RESISTANT JACKET 2.5dB/400 WATTS@ 30MHz	.15/FT	.13/FT	.11/FT
RG58A/U STRD CENTER 95% TC BRD UV RESISTANT JKT 2.6dB/350 WATTS @ 30MHz	.17/FT	.15/FT	.13/FT
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1618 8/COND (2/16 6/18) BLK UV RES JKT. Recommended up to 200ft	.35/FT	.34/FT	.32/FT
1418 8/COND (2/14 6/18) BLK UV RES JKT. Recommended up to 300ft	.47/FT	.45/FT	.43/FT
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14GA SOLID *"COPPERWELD" (for long spans etc.)*	.10/FT	.08/FT	.06/FT
14GA SOLID *"SOFT DRAWN" (for ground radials etc.)*	.10/FT	.08/FT	.06/FT
ROPE: 3/16" DOUBLE BRAID *"POLYESTER"* 770# TEST WEATHERPROOF	.12/FT	.09/FT	.08/FT
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high current flowed through the coherer, the particles would "stick" too strongly (actually, kind of weld) and then would not uncohere. Therefore, Marconi added "gain" in the form of the sensitive relay so that battery 1 could be low voltage (1.5 to 3 volts) and battery 2 could be higher voltage, such as 6 or 8 volts.

It is interesting to note that this receiver is truly an all-digital receiver with the coherer, sensitive relay, and tapper all two-state binary devices that produce a square wave to the analog headphones. Note that the voltage of battery 1 determines the earphone volume, and there are no tuning or volume controls on the receiver. Combining the all-digital receiver with the idea that the transmitted signal was spread spectrum, we find that some of our modern technology is really 100 years old! Have we come a long way or what?

Simulating the First Radio Transmission

Obviously, no one in his right mind would even consider operating an untuned spark transmitter in New York harbor today. The broadband signal, even at fairly low power, would severely interfere with thousands of radio services in the area.

Simulating the signal received at Twin Lights is a much simpler problem. All that is needed is a square-wave generator (easily produced by a 555 timer chip) and a low-pass audio filter which could be passive (using LC circuits), active (using op amps), or digital (using DSP). The resulting band-limited waveform could then be applied to an FM rig as modulated CW (MCW is legal above 50.1 and above 144.1 MHz). What's more, as long as the signal is band-limited to less than that of an SSB signal, it can be applied to an SSB rig tuned anywhere in the HF phone bands.

The above opens up interesting possibilities for a special-event station. Several tape recordings are being made up to simulate the received signal at Twin Lights. See the announcements of special-event stations in *CQ* and elsewhere for times and frequencies that N2MO, WA2GM, W2GSA, and W2OD will be sending a special Morse message in October commemorating the 100th anniversary of the first practical wireless transmissions in America. Special certificates will be issued to those stations successfully copying the short messages. Other special-event stations will also be on the air from the central New Jersey area. Again, check the announcements for details.

I invite all amateurs throughout the world to listen for these stations, work them, and send for commemorative QSLs and certificates by QSLing with SASEs. The resulting "wallpaper" will be proof that you participated in this historic event. ■

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- ***FULL PICTORIAL US TOWER INSTALLATION GUIDE***

Exclusively available for First Call Communications customers only is a new step by step pictorial guide for US Tower installations. Pictures, suggestions, and notes from ground breaking all the way up to the final antenna mounting process is covered. The guide also includes proper grounding techniques, rebar cages, forms, concrete, tower maintenance, wire rope maintenance, raising fixtures, masts and rotators, etc. etc. The pictures and commentary in this booklet were provided by tower installers hired by First Call in an actual installation setting.

- ***FIRST CALL COMMUNICATIONS NEWSLETTER - THE INFORMA***

First Call Communications, Inc. proudly announces our quarterly newsletter call THE INFORMA. THE INFORMA is a summary of information for potential US Tower buyers for the novice or experienced person. There are various sections covering maintenance of wire rope, obtaining town approval for a tower, etc. The newsletter offers the potential tower buyer three unique ways to buy and have a tower installed all the way up to a complete "TURNKEY SYSTEM". The newsletter is free with a S.A.S.E.

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CIRCLE 53 ON READER SERVICE CARD

The Digital Dipole

From Software Through Antennas For The Shack

BY KARL T. THURBER, JR., W8FX

September Sum-Up '99

Are you ready for some pre-fall fun? Check out this month's column for a heavy dose of antennas, software, and books. As is our custom, we'll set our sights first on antennas.

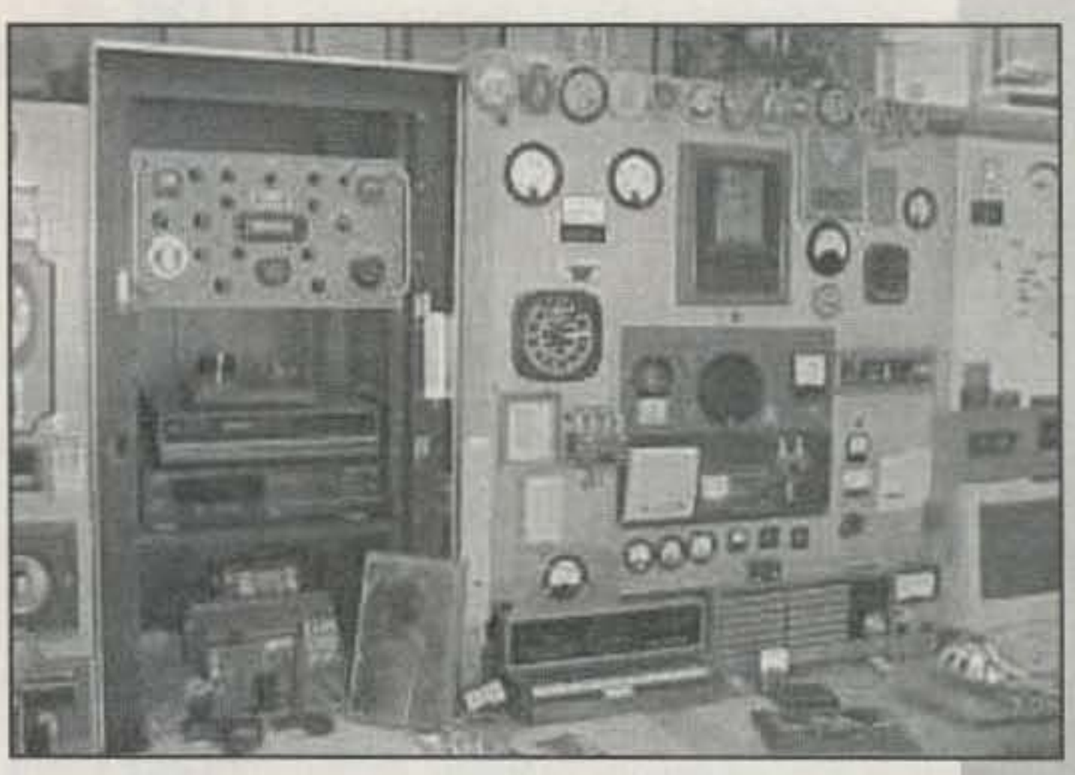
Antenna Notes

K7UGA: End of An Era. Many prominent personalities are amateur radio operators, although the best-known of them all, His Majesty King Hussein, JY1, and Senator Barry Goldwater, K7UGA, now are Silent Keys. This sad fact perhaps underscores the uncomfortable aging of our hobby and its members.

Barry, K7UGA, died on May 29, 1998. Since the 1960s he had quite an "antenna farm" to support his Paradise Valley, Arizona home and hamshack. An era ended as the March 19th "ARRL Letter" reported that his impressive antennas now were history. Five members of Barry's amateur radio club, the Central Arizona DX Association, dismantled the antenna system, taking about 5 hours to complete it. The buyer of the antennas remains anonymous, with the sale price kept confidential.

Senator Goldwater used a Hy-Gain RP-75H rotating pole assembly that was turned by a quarter-horsepower electric motor. The antennas were Hy-Gain LongJohns for 10, 15, and 20 meters, plus a big, 3-element 40 meter array. More information and photos are on the net at <http://www.azhub.com/goldwater/listings.htm>.

Incidentally, we pulled down the "ARRL Letter" information from the ARRL's "member's only" website, which features useful supplemental information available only to ARRL members. The special website includes goodies such as the online web magazine *ARRLWeb Extra;* the *QST* product review archive; the



Shown here is one corner of the famed K7UGA radio room, used by the late Senator Barry Goldwater, K7UGA, to complete thousands of phone patch messages for troops during the Vietnam War. Barry's home was in Paradise Valley, Arizona. (Source: Internet website <http://www.azhub.com/goldwater/listings.html>)

Members of Barry, K7UGA's amateur radio club, the Central Arizona DX Association, on the Hy-Gain RP-75H rotating pole assembly, dismantling part of the K7UGA antenna system. The main antennas were Hy-Gain LongJohns for 10, 15, and 20, plus a 3-element 40 meter array. (Source: Internet website <http://www.azhub.com/goldwater/listings.html>)

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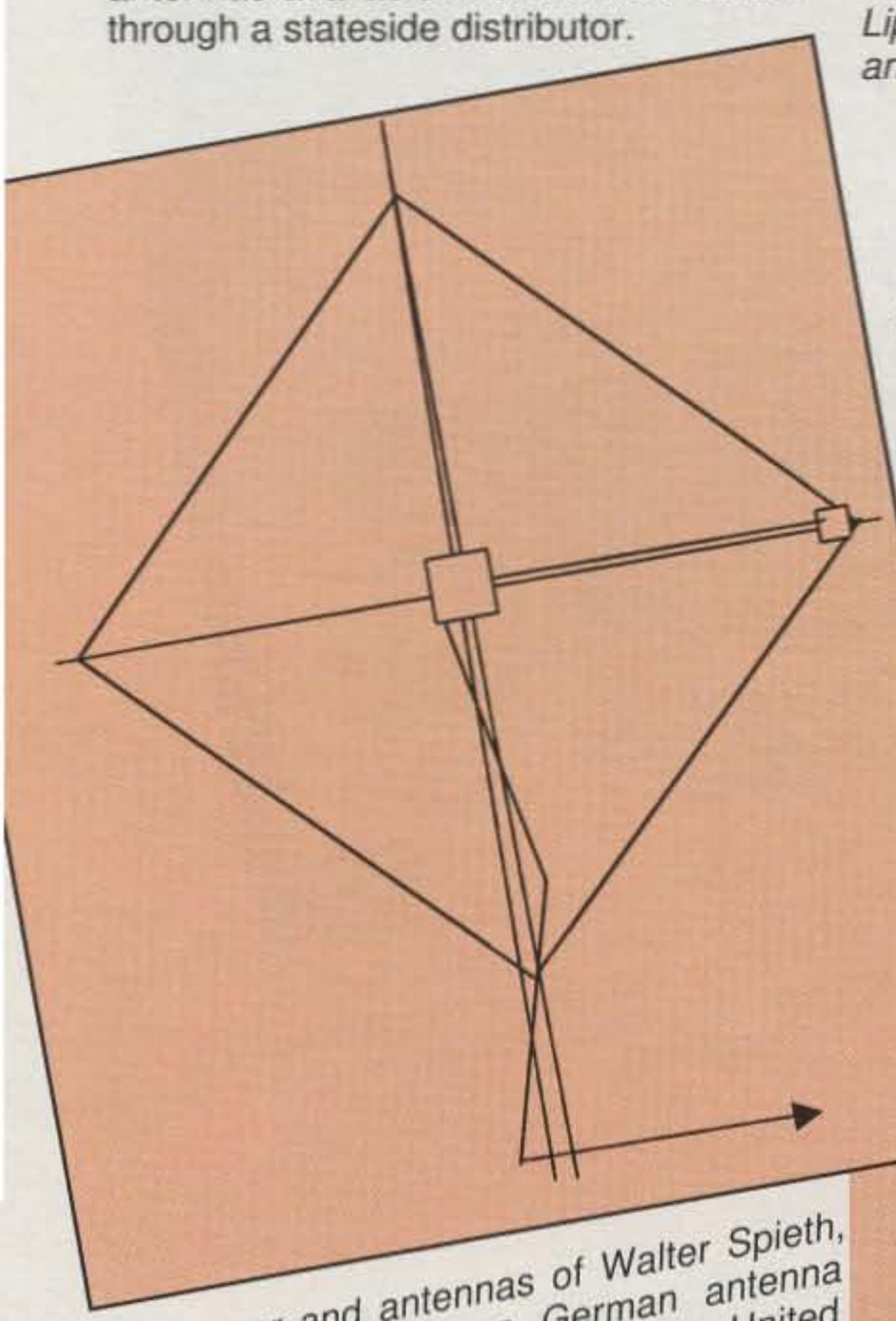
QST/QEX searchable article index; an e-mail forwarding service; and previews of contest results and product reviews. You'll find the password-accessed website at <http:// www.arrl.org/members>.

For more information, contact the American Radio Relay League, Inc., 225 Main St., Newington, CT 06111-1494 (860-594-0200; e-mail: <hq@arrl.org>; Internet: <http://www.arrl.org>).

DK9SQ Antennas. Well-known German antenna designer Walter Spieth, DK9SQ, recently made arrangements to have his portable telescopic tower and antennas available in the United States through a stateside distributor.



The tower and antennas of Walter Spieth, DK9SQ, a well-known German antenna designer, are now available in the United States through ADVIVUM, Inc. (see text).

Another popular DK9SQ product is the DX Vertical Loop Antenna for 10 through 40 meters, priced at $89; yet another is the W3DZZ Portable Antenna, a classic trap dipole for 40 and 80 meters ($59). Several other antennas also are offered.

The DK9SQ antennas are available through Walter Kern at ADVIVUM, Inc., 5825 Lengwood Drive, Cincinnati, OH 45244 (513-231-7018; e-mail: <advivum @fuse.net>). You also can communicate directly with DK9SQ via

One of Walter's most popular products is his 33 ft. Fiberglass Telescopic Mast, priced at $99, a quickly assembled mast for portable uses. Unassembled, it's very compact and light, only 3.8 ft. long and weighing 3.3 lbs. No tools are required for five-minute assembly; the ten telescopic segments need only be pulled out and twisted.

Also available is the lightweight, Duoband Portable Log Periodic Antenna for 2 meter and 70 cm operation; it also can be used for FM, TV, and scanner reception. The $89 antenna, which folds for transport, offers four elements on both bands. You can configure the antenna for vertical or horizontal polarization.

The solid-steel MFJ-345 Trunk/Hatchback Lip Mount is designed to secure large VHF and UHF, as well as medium-size HF, antennas to any lip on a vehicle.

The MFJ-340 Mirror/Luggage Pipe Clamp Mount mounts on the support rod of mirrors, luggage racks, or spare-tire carriers of a vehicle.

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MFJ RuffRider™ Antenna Mounts. The MFJ success story has long fascinated me. As MFJ celebrates its 27th birthday, I remember MFJ's small ads in the early 1970s when they had but few simple gadgets and accessories to offer. Today MFJ is the "accessory king" of amateur radio, with many hundreds of amateur radio accessories and other goodies in their catalog.

Under Martin F. Jue, K5FLU, MFJ today offers a long list of antennas and antenna accessories. Among their newest products of interest to our readers are the RuffRider Super Heavy Duty Antenna Mounts. They're offered in two versions.

The first version is the solid-steel MFJ-345 Trunk/Hatchback Lip Mount. It's designed to secure large VHF and UHF, as well as medium-size HF, antennas—even at highway speeds—to any lip on your vehicle. It sports an extra-wide, 4 inch lip and large reinforcing tabs on each side to safely distribute the load over your vehicle's lip. Two very large set screws on each end of the mounting lip lock the mount in place. The device mounts on lips at any angle, and it lets you position your antenna vertically, horizontally, or at any angle you choose.

The second item is the MFJ-340 Mirror/ Luggage Pipe Clamp Mount. It mounts on the support rod of mirrors, luggage racks, or spare-tire carriers of your truck, van, recreational vehicle (RV), or sport utility vehicle (SUV). The MFJ-340 mounts on any horizontal, vertical, or angled rod or pipe up to 5/8 inch diameter, securing VHF, UHF, and medium-size HF antennas at highway speeds. Two axes of rotation let you position your antenna at any angle, and the mount locks in any of 12 positions. A convenient thumb-and-finger turn knob makes fold-over operation easy.

Either mount is $34.95 plus s/h. Both are protected by MFJ's full one-year "No Matter What"™ warranty. Under it, MFJ will repair or replace the unit, at their option, no matter what happens to it. This is in addition to the standard 30-day money- back (less only shipping and handling charge) guarantee.

Contact MFJ Enterprises, Inc., Box 494, Mississippi State, MS 39762 (1-800-647-1800; e-mail: <techinfo@mfjenterprises.com>; web: <http://www.mfjenterprises. com>. *Note:* The MFJ website lets you download their current catalog and the story behind how the popular MFJ-259B HF/VHF SWR Analyzer™ is produced. The site also helps you keep updated on new products and clearance items.

FireStik® 1999 Antennas & Accessories Catalog. The FireStik Antenna Company primarily is a supplier of CB and scanner antennas. However, their 1999 catalog shows several popular amateur antennas, along with some useful antenna hardware and accessories of interest to radio amateurs.

Through its dealer network, FireStik offers the classic Model 2M-4 2 meter antenna, a 4 foot, 5/8-wave, wide-bandwidth design for 144 to 148 MHz with a low angle of radiation. The $16.99 list mobile antenna is rated at 400 watts AM or 800 watts PEP. You can even get it in colors: black, red, white, or blue.

Also offered is the new Model 2M-CKB 2 meter, 5/8-wave base antenna. It's similar to the 2M-4, but a combination angle bracket, U-bolt, hub plate, and antenna stud adapt the antenna for base-station use. It's $34.99.

Rounding out the amateur product line are the Mach-10 series 10 meter, 5/8-wave mobile antennas that boast high efficiency in a "tunable tip" design that lets you conveniently fine-tune the antenna to resonance.The series is available in black, red, white, or blue, and in two different lengths (the 3 ft. TM3 at $18.99, and the 4 ft. TM4 at $20.99). The shorter antenna handles 650 watts, while the longer one handles 900 watts.

FireStik also offers a wide variety of antenna accessories, including stainless- and non-stainless-steel mobile mounts and mounting brackets, stainless-steel springs, quick disconnects, coaxial cables, splitters, connectors, installation and repair parts, and other mobile-oriented hardware.

The FireStik® 1999 Antennas and Accessories catalog features several popular amateur antennas along with some useful antenna hardware and accessories.

For more information, contact FireStik Antenna Company, 2614 E. Adams St., Phoenix, AZ 85034-1495 (602- 273-7151; e-mail: <support@firestik.com>; web: <http://www.firestik.com>).

Soft Stuff

Copernic™ 99 and Copernic™ 99 Plus. Information everywhere on the Internet, and none to be found! Indeed, finding a specific resource on the Internet and the web can be difficult, but various search tools are available. Internet "search engines" are many, such as AltaVista, Excite, Infoseek, WebCrawler, GoTo.com, Yahoo, HotBot, and many others. These powerful tools let you search the web (and in some cases, other parts of the Internet, such as FTP sites, e-mail, and newsgroups) for names, addresses, keywords, phrases, and much more.

The problem is that the search engines rarely find everything on a search, and they don't return neatly formatted information ready for use. Rather, they return a hodgepodge that you must dig into, sort through, and follow up as "leads."

One solution is to use a so-called "metasearch engine," a special search engine that harnesses other search engines and assembles the results. Doing so can work well, but you don't have much flexibility as to how the search is conducted and how it is presented.

A perhaps better solution involves using a software application on your own PC that lets you control the searches. One such application is Copernic 99, from Copernic Technologies. It's a highly customizable searcher that you install on your computer, just like your Internet browser or e-mail software. The program helps you find what you're looking for by simultaneously using several user-selected search engines. The program does more than just find information for you; rather, it ranks results by relevance, provides summaries, stores the results on your disk, organizes them, and removes duplicates.

Copernic 99 offers a wide range of functions for effectively managing the results you obtain. For example, you can double-click on a given result to immediately display the document selected in your web browser. Another click removes inaccessible or dead links, saving you time and frustration. Still another click and the program downloads all the documents it found to your hard disk. And still another click produces a search report in webpage format. Very nice, indeed!

What makes all this a very good deal is that Copernic 99 is free. The free version is fully functional, although it is limited to three search categories (the web, newsgroups, and e-mail addresses), and it makes use of "only" 26 search engines. The full program, Copernic 99 Plus, does all this but allows you to harness about 125 different search engines. It also allows you to conduct searches in another 20-plus search categories, such as newspapers, sciences, tech reviews, software download, and more.

You can download Copernic 99 from the publisher's website at <http://www.copernic.com>. If you download Copernic 99 Plus from the site, it's $29.95 in U.S. funds ($19.95 for educational users). The product also is available on CD-ROM for $39.95.

For more information, contact Copernic Technologies, Inc., 2014, Jean-Talon Nord, #300, Sainte-Foy, Quebec, Canada G1N 4N6 (fax 418-527-1751; e-mail: <sales@copernic.com>; web: <http://www.copernic.com>).

HamCall™: Now Updated Weekly. In several previous columns, most recently July 1996, we profiled the Buckmaster HamCall™ CD-ROM. The publisher reports, first, that HamCall has been rated one of the "top 100" CD-ROM's by *PC Magazine*, and second, that it now is produced and updated weekly. This enhancement is significant in that when you order, you receive a CD-ROM less than one week old. Thus, the licensee data it contains arguably is the most comprehensive and current available.

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updated with FCC and international data. The program lets you look up amateurs by callsign, name, address, city, state, postal code, county, and country. You also can view and print available photographs, and edit records to add new data.

The menu-driven CD generally lets you display callsign, name, address, city, state, Zipcode, country, license issue date, expiration date, birthdate, previous callsign(s), previous license class, latitude, longitude, grid square, time zone, county, QSL manager, e-mail address, web address, and fax number. In addition, you can calculate beam heading and distance from your location to every callsign you look up.

The CD is $50 plus $5 s/h; purchase entitles you to free six-month password access to the publisher's Internet search service. For more information, contact Buckmaster Publishing, 6196 Jefferson Highway, Mineral, VA 23117 (1-800-282-5628; e-mail: <info@buck.com>).

From the Bookshelf

Fair Radio Sales Now on the Net. Over the years, the radio and electronics surplus market has changed considerably as military surplus decreased in availability and usability. Today much of the market is by mail-order only.

As we've noted before, most recently in December 1997, a reputable mail-order firm that still offers classic military and industrial radio surplus is Fair Radio Sales, in business since 1947. Most of their free catalog is devoted to, and crammed with, military, government, and commercial radio surplus; it's a gem I always look forward to receiving in the mail. The good news is that parts of it now are available on the Internet.

A surprising number of the items featured in the catalog are not of the questionably useful "boat anchor" type. Also, antennas and related products are well-represented in the catalog. For example, a recent catalog depicted several cavities, a 30 ft. aluminum alloy mast kit, an HF preselector module, coaxial cable, a direction-finding (DF) antenna, dummy loads, an impedance matching network, a weather balloon, and considerably more.

For a catalog, contact Fair Radio Sales Co., Inc., 1016 E. Eureka St., P.O. Box 1105, Lima, OH 45802 (419-223-2196; e-mail: <fairadio@wcoil.com>; web: <http://www2.wcoil.com/~fairadio>). I should mention that the website provides several useful functions as a supplement to current Fair Radio Sales catalogs, listing sold-out items and corrections to them.

Personal Money Management Guides from Macmillan. In several columns, we've noted the many books Macmillan Publishing USA offers which can help you become familiar with almost any aspect of PCs, software, and computing. The company, with its many trademarked imprints (QUE, Sams Publishing, New Riders, etc.), is accelerating its introductions of new computer titles, many of which we've mentioned in recent columns.

We normally don't cover financial books, but we nevertheless wanted to point out the availability of two new and useful Quicken®-based personal money management guides. Why? First, almost all of us can use advice along these lines; second, many of us use one of the popular Quicken personal finance programs for home and/or business use (I use Quicken Home & Business 99 to track both aspects of my financial life).

One of the books I received for review is *The Complete Idiot's Guide to Personal Finance with Quicken*, by Ed Paulson. The 336-page QUE® book is a beginning to intermediate level tutorial that bridges the gap between personal finance concepts and the software actually used to track your finances. While the $16.99 book is designed specifically to be used with Quicken, the author's personal finance explanations stand on their own, making it an excellent financial planning and budgeting resource.

The second book is *Using Quicken Deluxe 99*, by Stephen O'Brien. The 692-page, $29.99 QUE book is for those who are familiar with Quicken, but who don't need to explore every aspect of the software. The author shows how to set budgets, define savings goals, schedule transactions, and even use other editions of Quicken (including Quicken Basic, Quicken Deluxe, and Quicken Home & Business) to manage a small business. Chapters include coverage of Quicken essentials, online services, tax planning, investing, organizing financial records, managing a small business, and customizing Quicken.

The two QUE books are available in most bookstores, or contact Macmillan Publishing USA, 201 West 103rd Street, Indianapolis, IN 46290-1097 (1-800-858-7674) for a free computer books catalog. E-mail: <info@mcp.com>; web: <http://www.mcp.com>.

Macmillan's massive but easily navigable website is a treasure trove of useful information. The Macmillan site offers online computer resource centers, distance learning information, product support, software downloads, special offers, upcoming book previews, free online Ebook viewing, and other features that supplement Macmillan's computer books.

We Get Letters

Once again we're just about out of space. Before wrapping it up, though, we'd like to acknowledge some of the folks who wrote, faxed, e-mailed, phoned, or otherwise corresponded with us. A tip of the hat goes to John Bowman, N7RVW; Howarth Jones, GW3TMP; Bill Clarke, W2BLC; Keith Baker, KB1SF; Joe Fairclough, WB2JKJ; Kenny Guillot, WB5JLZ; Doug Lee, W9SPC; and Jose Sanabrais. Many thanks, folks—and keep those cards and letters coming!

Wrap-Up

That's all for this time, gang. Next time, more "Digital Dipole" topics of current interest. See you then.

Overheard: The only time that you're sure not to get something that you want is when you don't even try for it.

73, Karl, W8FX

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CQ Showcase

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ICOM's new IC-2800H has a full-color LCD display with user-selectable modes and video capabilities. The TFT color LCD remote-control head gives wide-angle viewing offering information such as scope, S meter, memory names, scan condition, and more. Brightness and contrast controls are easy to adjust and are located on the edit menu. With optional and/or third-party equipment, the user can preview real-time VCR or digital camera images, monitor TV broadcasts with a TV tuner, display GPS maps, etc.

Also featured are installation flexibility, a bandscope function; 9600 bps packet; independent tuning controls; memory editing; and a tuning dial, AF gain, squelch level control, and four function control switches available for each band. The IC-2800H control head is 5.5"W × 2.75"H × 1.3"D. The main unit is 5.5"W × 1.6"H × 6.6"D. It transmits 50 watts on 144–148 MHz and 35 watts on 430–450 MHz. For more information, contact ICOM America, Inc., 2380 116th Ave. NE, Bellevue, WA 98004 (425-454-8155; for a free brochure 425-450-6088; or check the website: <www.icomamerica.com>), or circle number 105 on the reader service card.

Alinco DJ-195T 2 Meter HT

Alinco's DJ-195T is designed to operate on the 144–148 MHz band and features alphanumeric display, up to 5 watts power output, 40 memories, receiver coverage from 130–174 MHz, CTCSS encode and decode, digital code squelch (DCS), and autodialer memories. The HT also includes a theft alarm that when activated sounds when the unit is removed from an external power source, such as in a mobile environment. An experimental "mosquito repel" feature may keep the insects away from the vicinity of the radio through the emission of an electronic tone. Additional features include standard high-output (5 watts) battery, 13.8 VDC direct input, cable cloning, BNC antenna connector, European tone bursts, autodial memories, and MARS/CAP capability.

For more information, contact Alinco, 438 Amapola Ave., Suite 130, Torrance, CA 90501 (phone 310-618-8616; fax 310-618-8758), or circle number 101 on the reader service card.

MFJ MightyLite™ Switching Power Supply

The new streamline-size 25 amp MFJ MightyLite™ switching power supply is free of RF hash and meets all FCC Class B regulations, maker says. Features include less than 35 mV peak-to-peak ripple under 25 amp load (load regulation better than 1.5% under full load); 25 amps maximum surge; 22 amps continuous; speaker-type terminals for low-current accessories; heavy-duty five-way binding post for high-current transceivers;over-voltage protection; over-current protection; quiet internal cooling fan; switchable input voltage (110 VAC or 220 VAC); works with AC input from 85 to 135 VAC or from 170 to 260 VAC.

The model MFJ-4125 MightyLite™ is 5 1/2"W × 2 1/2"H × 10 3/4"D and weighs 3.5 lbs. It is retail priced at $109.95 and is covered by MFJ's "No Matter What™" one-year limited warranty. For more information, contact MFJ Enterprises, Inc., Box 494, Mississippi State, MS 39762 (orders 1-800-647-1800; fax 601-323-6551; e-mail: <mfj@mfjenterprises.com>; web: <http://www.mfjenterprises.com>), or circle 103 on the reader service card.

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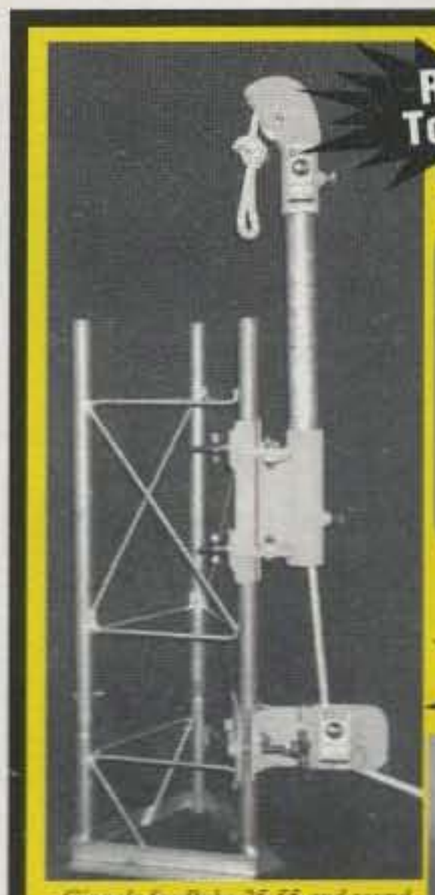
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Announcements *(from page 6)*

Section Convention, Erie County Fairgrounds, **Hamburg, NY** (near Buffalo). Contact Harold Smith, K2HC, 716-424-7184; <http://www.buffalohamfest.org>; e-mail: <info@buffalohamfest.org>.

Sept. 18, **Grand Rapids ARA Super-Swap**, Caledonia High School, **Grand Rapids, MI**.Contact Ed Novakowski, N8UXN, 616-458-9029, or e-mail: <barbv@voyager.net>.

Sept. 18, **El Paso SW International Hamfiesta**, Ysleta Independent Cultural Arts Center, **El Paso, TX**. Contact Craig Lyles, KC7UXM, 915-821-7501.

Sept. 18, **BARC Hamfest**, Ella Burr School, **Lincoln, ME**. Call Max Soucia, 207-564-8943. (Exams)

Sept. 18, **W9DXCC Midwest DX Convention**, Holiday Inn, **Rolling Meadows, IL**. Contact Phil Camera, KB9CRY, 708-343-1696; fax: 708-343-1696; e-mail: iphil@mediaone.net>.

Sept. 18–19, **Weinheim VHF Conference**, Mannheimer Maimarkthalle (Mannheim May Fair Centre) near **Weinheim, Germany** (new location). Visit the Weinheim VHF Conference Web site at <http://www.hamradio.de/weinheim>.

Sept. 19, **Tailgate Electronics, Computer and Amateur Radio Fleamarket**, Albany & Main St., **Cambridge, MA**. Contact W1GSL, P.O. Box 397082 MIT BR., Cambridge, MA 02139-7082. (Handicapped accessible)

Sept. 19, **Adrian ARC Hamfest & Computer Show**, Lenawee County Fairgrounds, **Adrian, MI**. Contact Brian J. Sarkisian, KG8CO, at 517-265-1537; e-mail: <kg8co@lni.net>; web: <http://www.LNI.net/w8tqe>. (Exams)

Sept. 19, **FallFest '99 Hamfest**, Tall Cedars of Lebanon Picnic Grove, Sawmill Rd., **Hamilton Twp, NJ**. Call 609-882-2240; on the web: <www.slac.com/w2zq>.

Sept. 19, **Communications Expo '99 Hamfest & Electronics Show**, Kolping Center, **Cincinnati, OH**. Contact Tom Denham, K8VOE, 513-779-3951; e-mail: <tdenham@eos.net>. (Exams)

Sept. 19, **CARA Hamfest**, Edmond Town Hall, **Newtown, CT**. Call 203-857-7050; web: <http:// www.danbury.lib.ct.us/org/cara/>. (Handicapped access.)

Sept. 22, **St. Charles ARC Hamfest '99**, Blanchette Park, **St. Charles, MO**. Contact Ken Fieser, 314-428-4383; e-mail: <kfieser@aol.com>; web: <http://www.qth.com/wbØhsi/>.

Sept. 24–26, **Lancaster Super Moose Festival Hamfest/Computer Fleamarket**, Lancaster Fairgrounds, **Lancaster, NH**. Contact United Way of Northern NH, 603-752-3343; e-mail: <unitdway@ncia.net>.

Sept. 24–26, **ARRL/TAPR Digital Communications Conference**, **Phoenix Arizona**. Contact Tucson Amateur Packet Radio, 940-383-0000; fax: 940-566-2544; e-mail: <tapr@tapr.org>; web: <http://www.tapr.org/dcc>.

Sept. 24–25, **28th Leicester Amateur Radio Show**, Donington Park, Castle Donington, NW **Leicestershire, England.** Contact Geoff Dover, G4AFJ, tel. +44 1455 823344; e-mail: <g4afj@argonet.co.uk>; <http://www.lars.org.uk>.

Sept. 25, **Michigan ARRL Ham Radio State Convention**, University of Michigan Flint Campus, **Flint, MI**. Contact Debbie Kirkbride, KA8YKK, 517-892-1212 eves.; 517-892-5501 days (M–F, 9–5); e-mail <ka8ykk@concentric.net>.

Sept. 25, **Elmira International Hamfest/ Computerfest**, Chemung County Fairgrounds, **Horseheads, NY**. Call Dave at 607-589-7495; web: <http://www.arast.org>; e-mail: <info@arast.org>. (Exams)

Sept. 25, **South Jersey RA Hamfest/Computer Show**, Mount Holly Armory, **Mount Holly, NJ**. Contact Joe Cramer, N2XYZ, 609-268-2135; e-mail: <hamfest@sjra.org>.

Sept. 25–26, **Anchorage ARC Hamfest, ARRL Alaska State Convention**, Regal Alaskan Hotel, **Anchorage, AK**. Contact Rick (KL7YF) and Lillian (NL7DL) Marvin, 907-277-6741; e-mail: <rlment@alaska.net>.

Sept. 26, **Giant Electronic Flea Market**, Lincoln High School, **Yonkers, NY**. Contact Otto Supliski, WB2SLQ, 914-969-1053. (Exams)

Sept. 26, **Framingham Fleamarket & VEC Session**, Fraamingham High School, **Framingham, MA**. Contact Bev Lees, N1LOO, 508-626-2012. (Exam info Dick Marshall, K1KTK, 508-303-8336)

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FNB-12(S)	12v @	600 MAH
FNB-17	7.2v @	600 MAH
FNB-25	7.2v @	600 MAH
FNB-26	7.2v @	1200 MAH
**FNB-26(S)	7.2v @	1500 MAH
FNB27	12v @	600 MAH
**FNB-27(S)	12v @	800 MAH
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FNB-31	4.8v @	600 MAH
FNB-33(S)	4.8v @	1500 MAH
FNB-35(S)	7.2v @	600 MAH
*FNB-35(S)(S)	7.2v @	1500 MAH
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Math's Notes

BY IRWIN MATH, WA2NDM

What's New And How To Use It

Amateur Radio Licensing—My Point of View

With all of the talk and conflict regarding the structure and proposed changes to the amateur radio license classes, I felt that it was about time I indicated my feelings on the subject. Please bear in mind that while this is being written, changes in the structure of the hobby have not yet occurred. However, if by some chance the FCC has ruled by the time you read this, I would still like to present my feelings.

As those of you who have been reading this column for the past 20-plus years know, I am an avid experimenter and believe wholeheartedly in "getting your hands wet" (but obviously not with the power turned on). I also understand and enjoy the other side of the hobby—ragchewing and socializing, etc.—and as a result, my version of what I feel should transpire has to encompass both points of view.

Please bear with me this month while I get on the soapbox. I promise that in the October column we will get back to our normal business.

To begin with, amateur radio is a hobby that, at least in principle, should be available to anyone, as are most other hobbies. It is not meant to be an exclusive society, although there are some who would like to keep it that way. As in any true hobby, in amateur radio there are those who just want to "play" and there are those who want to build just about everything from refining and manufacturing wire from raw ore to turning beach sand into semiconductors. I feel that both of these extremes should be recognized and that entering the amateur community should be exciting and easy. I also believe that since this hobby can result in communicating with the world, causing all sorts of interference with other nonhobby services or even putting the hobbyist and others in a life-threatening situation, there are certain rules and regulations that absolutely must be understood and abided by without exception. So, with all of this in mind, here are my guidelines.

The first element in all classes of licenses must be the demonstration by the applicant of a thorough understanding of the rules and regulations regarding both the national and international aspects of wireless communications. This would be primarily non-technical, but would require the applicant to understand the seriousness of virtually unlimited worldwide communications, the problems that operating outside of mandated band limits could produce, and the various legal implications of interacting with other countries, the laws of which may differ from our own. In addition, I would require that the applicant demonstrate a full understanding of basic electrical safety to assure that he (or she) does not kill himself or others due to reckless practices. To drive home these points, perhaps even some sort of legal release that puts the onus of any wrong doing solely on the shoulders of the licensee should be part of the requirement for the issuance of a license. Minors would have to have a legal guardian sign and agree to accept full responsibility for them. In my opinion, a full understanding of the above is far more important than demonstrating the ability to copy CW.

I believe that there should be two main classes of licenses. One should be oriented toward the person who only wishes to communicate and the other toward the experimenter. The class of license that would cater to the "communicator," whose only interest in the hobby is to communicate with others locally or around the world, would be non-technical for the most part and would require the use of FCC-approved, factory-manufactured, store-bought equipment only. Specific frequencies would be allocated for this class throughout the spectrum, and various modes of operation such as CW, AM, FM, ATV, etc., would be allowed.

This class of license would have three levels. The first would be an entry-level permit limited to low-power, voice-type communications, etc., and would basically allow a newcomer to "get a feel for" the hobby. The second level would be oriented toward the more experienced operator with additional frequencies, high-power privileges, and additional modes such as CW, ATV, etc. The third level would allow all privileges and modes of operation and would only be granted to those with adequate demonstrated experience.

A mandatory period of time and required number of operating hours to gain and hone operating skills would be a prerequisite toward moving to a higher level. I would also add an additional exam (when changing levels) which would demonstrate that the applicant has achieved the proper operating skills, and possibly even require some actual letters of recommendation from fellow amateurs as part of the upgrading process. None of these levels, however, would allow any sort of significant modification to the transmitting portion of any equipment employed.

The other class of license would be technical in nature and would be oriented toward the experimenter. Here there would also be three levels. The first, as in the case of the communicator class, would be an entry-level permit that would allow the operator to build low-power equipment in specific frequency bands just for that purpose. The types of modulation would be limited to low-power CW and AM, and the bands allocated for this service would be wide enough to accept the relatively poor stability simple equipment such an experimenter would build. However, the primary aim would be to encourage homebrewing.

The next level up would allow additional modes of operation such as SSB, FM, ATV, Digital, etc., and would also make additional frequencies and moderate power levels available. Technical factors of equipment employed, such as stability and frequency accuracy, would be proportionally tightened at this level.

The final level would allow the truly technically adept to experiment with the very latest techniques, such as spread-spectrum digital, high-speed pulse techniques, microwave, etc. Moving from one level to another would require the passing of stiff technical examinations that would assure the applicant has a good working knowledge of the techniques that might be employed at any particular level.

Depending on the wishes of an applicant, licenses could be held in either or both classes. CW, as already mentioned, would not be required but could certainly be used, as could all other forms of modulation. Bands would be spaced throughout the spectrum, as they are now, to allow the licensee to experience the effects of both low- as well as high-frequency RF. Penalties for willful misuse of privileges would be severe, and confiscation of equipment as well as fines would be allowed for serious infractions.

The above is a general description of my views. Obviously, specific details would have to be worked out, but I think the overall "flavor" would suite the hobby and perhaps encourage newcomers. I would be interested in your views and would like to thank Ben, KB2WMO, whose encouragement prompted me to present my views. 73, Irwin, WA2NDM

c/o CQ magazine

Announcing:

The 1999 CQ WW DX Contest

Phone: October 30–31 CW: November 27–28
Starts 0000 GMT Saturday Ends 2400 GMT Sunday

I. OBJECTIVE: For amateurs around the world to contact other amateurs in as many zones and countries as possible.

II. BANDS: All bands, 1.8 through 28 MHz, except for WARC bands.

III. TYPE OF COMPETITION (choose only one):

For all categories: All entrants must operate within the limits of their chosen category when performing any activity that could impact their submitted score. Transmitters and receivers must be located within a 500 meter diameter circle or within the property limits of the station licensee's address, whichever is greater. All antennas used by the entrant must be physically connected by wires to the transmitters and receivers used by the entrant. Only the entrant's callsign can be used to aid the entrant's score. **A different callsign must be used for each CQ WW entry.**

A. Single Operator Categories: Single band or all band; only one signal allowed at any one time; the operator can change bands at any time.

1. Single Operator High: Those stations at which one person performs all of the operating, logging, and spotting functions. The use of DX alerting assistance of any kind places the station in the Single Operator Assisted category.

2. Single Operator Low: Same as III A 1 except that the output power shall not exceed 100 watts (see rule XI. 11).

3. QRPp: Same as III A 1, except that the power output must not exceed 5 watts (see rule XI.11).

B. Single Operator Assisted: Same as III A 1 except the passive (self-spotting not allowed) use of DX spotting nets is allowed.

C. Multi-Operator (all band operation only):

1. Single Transmitter: Only one transmitter and one band permitted during any 10-minute period, defined as starting with the first logged QSO on a band. Exception: One—and only one—other band may be used during any 10-minute period if—and only if—the station worked is a new multiplier. Logs found in violation of the 10-minute rule will be automatically reclassified as multi-multi.

2. Multi-Transmitter: No limit to transmitters, but only one signal and running station allowed per band.

D. Team Contesting: A team consists of any five radio amateurs operating in the single operator category. A person can be on only one team per mode. Competing on a team will not prevent any team member from submitting his personal score for a radio club. A team score will be the sum of all the team member scores. SSB and CW teams are totally separate. That is, a member of an SSB team can be on a totally different CW team. A list of a team's members must be received at *CQ* Headquarters by the time the contest begins. Mail or FAX the list to *CQ*, Att: Team Contest, 25 Newbridge Road, Hicksville, NY 11801 U.S.A.; FAX 516-681-2926. Awards will be given to the top teams on each mode.

IV. NUMBER EXCHANGE: Phone: RS report plus zone (i.e., 5705). CW: RST report plus zone (i.e., 57905).

V. MULTIPLIER: Two types of multiplier will be used.

1. A multiplier of one (1) for each different zone contacted on each band.

2. A multiplier of one (1) for each different country contacted on each band.

Stations are permitted to contact their own country and zone for multiplier credit. The *CQ* Zone Map, DXCC country list, WAE country list, and WAC boundaries are standards. Maritime mobile stations count only for a zone multiplier.

VI. POINTS: 1. Contacts between stations on different continents are worth three (3) points.

2. Contacts between stations on the same continent but different countries, one (1) point. *Exception:* For North American stations *only*, contacts between stations within the North American boundaries count two (2) points.

3. Contacts between stations in the same country are permitted for zone or country multiplier credit but have zero (0) point value.

VII. SCORING: All stations: the final score is the result of the total QSO points multiplied by the sum of your zone and country multiplier.

Example: 1000 QSO points × 100 multiplier (30 Zones + 70 Countries) = 100,000 (final score).

VIII. AWARDS: First-place certificates will be awarded in each category listed under Sec.III in every participating country and in each call area of the United States, Canada, European Russia, Spain, and Japan.

All scores will be published. To be eligible for an award, a Single Operator station must show a minimum of 12 hours of operation. Multi-operator stations must operate a minimum of 24 hours. A single-band log is eligible for a single-band award *only*. If a log contains more than one band it will be judged as an all-band entry, unless specified otherwise.

In countries or sections where the returns justify, 2nd and 3rd place awards will be made.

All certificates/plaques will be issued to the licensee of the station used.

IX. TROPHIES & PLAQUES (Donors)

PHONE

Single Operator, All Band
World: Dave Rosen, K2GM – WA2RAU Memorial
World Low Power: Slovenia Contest Club
World QRP: Lew Sayre, W7EW
World Assisted: Snake River Contest Club
U.S.A: Potomac Valley R.C. – KC8C Memorial
U.S.A. Low Power: North Coast Contesters
U.S.A. Zone 3: Bill Fisher, W4AN
U.S.A. Zone 4: *CQ* Magazine
Canada: Niagara Frontier Int'l DX Assn. – VE3WT Memorial
Caribbean/C.A.: Alex M. Kasevich, VP2MM
Europe: Potomac Valley R.C. – W4BVV Memorial
Europe Low Power: Scott Jones, N3RA & Tim Duffy, K3LR
Scandinavia: Charles Weir Jr., W6UM – Charles Weir, Sr., W3FYS Mem.
Africa: Gordon Marshall, W6RR
Asia: 2 AM Dayton Pizza Gang
Japan: Japan Crazy Contesters Club
Oceania: Northern California DX Club
S. America: Yankee Clipper Contest Club
S. America, Mainland: Jose Bachmann, ZP6CC, & Cesar Ivaldi, ZP5K

Single Operator, Single Band
World—28 MHz: Joel Chalmers, KG6DX
World—21 MHz: Robert Naumann, N5NJ
World—14 MHz: North Jersey DX Assn. – K2HLB Memorial
World—7 MHz: Fred Laun, K3ZO – K7ZZ Memorial
World—3.8 MHz: Fred Capossela, K6SSS
World—1.8 MHz: Bob Wruble, W7GG
USA—28 MHz: Donald Thomas, N6DT
USA—21 MHz: David Hueben, KB0ISS
USA—14 MHz: Southern California DX Club
USA—7 MHz: Stanley Cohen, W8QDQ
USA—3.8 MHz: Arnold Tamchin, W2HCW
USA—1.8 MHz: *CQ* Magazine
Carib./C.A.: Snake River Contest Club
Europe—28 MHz: Chod Harris, VP2ML
Europe—21 MHz: Tine Brajnik, S50A
Europe—14 MHz: A.G. Anderson, GM3BCL
Europe—7 MHz: Roger Burt, N4ZC
Europe—3.8 MHz: Marconi Contest Club – I3MAU Memorial
Europe—1.8 MHz: Robert Kasca, S53R
Oceania: Bruce D. Lee, KD6WW
Japan—21 MHz: DX Family Foundation
Japan—14 MHz: Take Yokoyama, JL1BLW

Multi-Operator, Single Transmitter
World: Southern Calif. DX Club – W6AM Memorial
U.S.A.: Carolina DX Association
Europe: Bob Cox, K3EST
Carib./C.A.: Eric Scace, K3NA
Oceania: Junichi Tanaka, JH4RHF
Africa: *CQ* Magazine
S. America: Victor Burns, KI6IM
S. America, Mainland: T. Zappini, ZP5AZL, & R. Bellucci, ZP5XF
Asia: Edward Campbell, AH2BE

Multi-Operator, Multi-Transmitter
World: Dave & Barb Lesson, W6NL & K6BL
U.S.A.: Paul Hellenberg, K4JA
Europe: Finnish Amateur Radio League
Japan: Ryozo Goto, JH3JYS

Contest Expeditions
World-Single Operator: National Capitol DXA – W2GHK Memorial

World Multi-Single: Dieter Loffler, DK9KD – DJ3NG & DJ4EI Memorial
World Multi-Multi: Tachio Yuasa, JA9VDA

Special-Single Operator Award
World-All Band Under 21 years old: Gene Zimmerman, W3ZZ
World-All Band YL: Yutaka Tanaka, JH3DPB – KA6V Memorial

CW

Single Operator, All Band
World: Albert Kahn, K4FW – W9IOP Memorial
World Low Power: Slovenia Contest Club
World Assisted – Snake River Contest Club
World QRPp: Gene Walsh, N2AA
U.S.A: Frankford Radio Club
U.S.A. Low Power: North Coast Contesters
U.S.A. Zone 4: *CQ* Magazine
U.S.A. Zone 3: Bill Fisher, W4AN
Canada: Jim Fisher, Jr., VE1JF
Caribbean/C.A.: Chuck Shinn, W7MAP
Europe: Edward Bissell, W3AU
Europe Low Power: Scott Jones, WR3G & Tim Duffy, K3LR
Africa: Gordon Marshall, W6RR
Asia: Chuck Shinn, W7MAP
Japan: Japan Crazy Contesters Club
Oceania: Peahi Contest Club
S. America: Venezuela DX Club

Single Operator, Single Band
World—28 MHz: Joel Chalmers, KG6DX
World—21 MHz: Don Busick, K5AAD – N5JJ Memorial
World—14 MHz: North Jersey DX Assn. – W2JT Memorial
World—7 MHz: Alex M. Kasevich, VP2MM/W4
World—3.8 MHz: Fred Capossela, K6SSS
World—1.8 MHz: Kenneth Byers, Jr., K4TEA
USA—28 MHz: *CQ* Magazine
USA—21 MHz: Wayne Carroll, W4MPY
USA—14 MHz: Northern Illinois DX Association
USA—7 MHz: Jan Perkins, N6AW – W6AM Memorial
USA—3.5 MHz: Bill Feidt, NG3K
USA—1.8 MHz: *CQ* Magazine
Canada: Radio Amateurs of Canada
Carib./C.A.: Snake River Contest Club
Europe—28 MHz: Jay Pryor, K4OGG
Europe—21 MHz: Robert Naumann, N5NJ
Europe—14 MHz: Maud Slater – G3FXB Memorial
Europe—7 MHz: Ivo Pezer, T93A/5B4ADA
Europe—3.5 MHz: Frankford Radio Club – K3VW Memorial
Europe—1.8 MHz: Pat Barkey, N9RV & Terry Zivney, N4TZ
Japan—21 MHz: DX Family Foundation
Japan—14 MHz: Mitsuhiro Nishimura, JA7WME

Multi-Operator, Single Transmitter
World: Anthony Susen, W3AOH
U.S.A.: Douglas Zwiebel, KR2Q
Canada: Eastern Canadian DX Assn.
Carib./C.A.: Octorino G. Villa, PY2KC
Africa: Harry Booklan, RA3AUU
Europe: Bob Cox, K3EST
Oceania & Asiatic Pacific Rim: Junichi Tanaka, JH4RHF
S. America: Tyler Stewart, K3MM
Asia: Steve Merchant, K6AW

Multi-Operator, Multi-Transmitter
World: Douglas Zwiebel, KR2Q – Hazard Reeves, K2GL Memorial
World SSB/CW Combined: Alpha/Power, Inc.
U.S.A.: Bob Ferrero, W6RJ – N6RJ Memorial
Europe: Finnish Amateur Radio League
Japan: Ryozo Goto, JH3JYS

Contest Expeditions
World Single-Operator: Yankee Clipper Contest Club
World Multi-Single: Carl Cook, AI6V
World Multi-Multi: Bill Schneider, K2TT

Special-Single Operator Award
World SSB/CW Combined: Hrane Milosevic, YT1AD
World All Band Under 21 years old: Chuck Shinn, W7MAP

Club
World SSB/CW: *CQ* Magazine – W1WY Memorial
Non-USA SSB/CW: N. California Contest Club – N6AUV Memorial

A station winning a World trophy will not be considered for a sub-area award. The trophy will be awarded to the runner-up in that area.

X. CLUB COMPETITION:

1. The club must be a local group and not a national organization.

2. Participation is limited to members operating within a local geographic area defined as within a 275 km radius from center of club area (except for DXpeditions especially organized for operation in the contest; club contributions of DXpedition scores are percentaged to the number of club members on the DXpedition).

3. To be listed, a minimum of 3 logs must be received from a club and an officer of the club must submit a list of participating members and their scores, both on phone and CW.

XI. LOG INSTRUCTIONS:

1. All times must be in GMT.

2. All sent and received exchanges are to be logged.

3. Indicate zone and country multiplier only the FIRST TIME it is worked on each band.

4. Logs must be checked for duplicate contacts, correct QSO points and multipliers. Submitted logs must have duplicate contacts clearly shown.

5. We prefer an electronic log. The Committee requires an electronic log for any possible high score. DISKS: If you use a computer, please send your IBM, MS-DOS compatible computer disk. A disk containing your files may be submitted in lieu of a paper log. All disks MUST be accompanied by a PAPER summary sheet satisfying all logging instructions. Label your disk clearly with YOUR CALL, files included, the mode (SSB or CW), and your category. The format we require for the most common logging programs is your CT.all file (e.g. HSØAC.all), N6TR.DAT, or NA.QDF files. Name your file correctly (for example, HSØAC.all).

E-MAIL Required Content: (1) A SUMMARY sheet in plain-text ASCII, and (2) your LOG in plain-text ASCII. These files may be sent in either one message or in separate messages. Be sure to put the **STATION CALLSIGN** and the **MODE** in the "Subject:" line of each message.

Your log should be sent in plain-text ASCII format. Every logging program has the option of producing an ASCII text log. Examples of the ASCII log file names of the three most common logging programs are the following: **CT = YOURCALL.ALL**, **NA = YOURCALL.PRN**, and **TR = YOURCALL.DAT**. Acceptable submissions can also include all other fixed-column ASCII formats. If you must send a binary file, it will have to be encoded. All popular encoding schemes are acceptable, including UUencode, Base64, and BinHex. Your software may automatically encode your log as an attachment.

Your e-mail log will automatically be acknowledged by the server. You will also receive a personal access code from the server. Use this code to view your log for completeness and later to retrieve your computer analysis. If we have trouble reading your file, we may ask you to send a disk. Submit your CQ WW SSB log to **<ssb@cqww.com>** and your CQ WW CW log to **<cw@cqww.com>**.

6. Use a separate sheet for each band.

7. Each entry must be accompanied by a summary sheet showing all scoring information, category of competition, contestant's name and address in BLOCK LETTERS, and a signed declaration that all contest rules and regulations for amateur radio in the country of operation have been observed.

8. Sample log and summary sheets and zone maps are available from *CQ*. A large self-addressed envelope with sufficient postage or IRCs must accompany your request. If official forms are not available, make up your own 80 contacts to the page on 8 1/2" × 11" paper.

9. All entrants are required to submit cross-check sheets (an alphabetical list of calls worked) for each band on which 200 or more QSOs were made. All other entrants are encouraged to submit cross-check sheets.

10. Duplicate contacts and broken QSOs penalty: three (3) additional contacts removed.

11. QRPp and low power stations must indicate same on their summary sheets and state the actual maximum power output used, with a signed declaration.

XII. DISQUALIFICATION: Violation of amateur radio regulations in the country of the contestant, or the rules of the contest; unsportsmanlike conduct; taking credit for excessive duplicate contacts; unverifiable QSOs; or unverifiable multipliers will be deemed sufficient cause for disqualification. Incorrectly logged calls will be counted as unverifiable contacts.

An entrant whose log is deemed by the Committee to contain a large number of discrepancies may be disqualified from eligibility for an award, both as a participant operator or station, for one year. If an operator is disqualified a second time within 5 years, he will be ineligible for any *CQ* contest awards for 3 years.

The use by an entrant of any non-amateur means such as telephones, telegrams, internet, or the use of packet to SOLICIT contacts during the contest is unsportsmanlike and the entry is subject to disqualification. Action and decisions of the *CQ* Contest Committee are official and final.

XIII. DEADLINE:

1. All entries must be postmarked NO LATER than December 1, 1999 for the SSB section and January 15, 2000 for the CW section. **Indicate SSB or CW on the envelope, disk, or e-mail.**

2. An extension of up to one month may be given if requested by letter or other means. The granted extension must be confirmed by letter sent to the contest director, must state a legitimate reason, and the request must be received before the log mailing deadline. Logs postmarked after the extension deadline may be listed in the results but will be declared ineligible for an award.

Both Phone and CW logs should be sent to *CQ* Magazine, 25 Newbridge Road, Hicksville, NY 11801.

VHF Plus

BY JOE LYNCH, N6CL

All About The World Above HF

Fireworks on 2 Meters

The Fourth of July weekend found some people home and others away, as usual. For those who had their 2-meter radios on, in particular in the midwest, southwest, and east, 2 meters provided as much excitement as watching a Fourth of July fireworks display. And, like the holiday extending into Monday, the band openings also showed up the next, and the next days. Unfortunately, many VHFers were on holiday, and away from their radios. The sparseness of the activity reflected this situation. The following are some of the reports that appeared on the VHF reflector

"Just worked KØPJ in Minnesota. Band is open but not a lot of activity." Russ, K2TXB. "Worked K1RZ and K2TXB, both peaked about 58 on 2 meters. Heard K1RZ on 432 but no QSO." Greg, KØPJ. "I just worked W5SFW in DM95 at 0050, 7/5/99." Paul, N8IEZ. "Hi all. Guess I was in the right spot, here is who I worked on 2 meters 0146, KB4S, EM72; 0150, KU4UK, EM64; 0151, KC5GSK, EM73; 0153, W4HP, EM75; 0157, KU4IU, EM54; 0158, KU4WW, EM54; 0205, WU4C, EM82; 0217, W4GLV, EM83; 0220, KE4SIX, EM83; 0221, W4WTA, EM83; 0222, WB2WEO, EM93; 0229, W4CK, EM93; 0229, K4AR, EM76; 0232, KG4BMH, EM76; AND 0338, K4RIG, EM86. It was a fun opening and I was surprised by how short the skip was on 2 meters. My IF rig is down so I didn't have any way to get a chance on the higher bands." Mark Brown, KBØPYO.

"I came home from the neighborhood party, turned on 2 m and heard EM61, 62 and EM75 coming in. Lots of locals calling so I just listened (OK, I called a few times). The station in EM75 was very strong when I had to leave to go watch fireworks with the family. He was about 800 miles from me. Did anyone try on 222? The MUF was definitely above 2 meters and there could have been propagation via Es or FAI. Just curious." Rich, NØHJZ (EN34fv).

"What a great 2-meter opening last night. The band opened at 0144 and closed at 0228 UTC. I worked 25 stations in 10 grids—stations in Ohio, Maryland, Pennsylvania, and West Virginia. Grids worked from DM78 were EM89, 99, 79, FM19, EN90, 70, 80, 91, FM09, and FN11. I never turned on the amplifier and worked all the stations with 100 watts and a 16-element KLM. The only limiting factor was the lack of activity.

"Stations worked were 0144, KE8FD, EM89; 0144, K8RYU, EM99; 0145, KD8FO, EM79; 0146, KC8LGL, EM79; 0146, WA8CXI, EM99; 0148, KB8ZMJ, EM99; 0149, W8PLZ, EM79; 0150, KE8FD, EM89; 0152, KD8FO, EM79; 0152, K1RZ, FM19; 0153, WB8XX, EM79; 0155, N8XA, EM79; 0155, N3JAL, EN90; 0157, WA1MLE, EN70, Mobile station; 0157, KC8CCD, EM79; 0159, K8TQK, EM89; 0159, N8KOL, EN80; 0200, N8NYE, EN91; 0200, N8LGP, EN91; 0202, K8ISK, EM79; 0204, K8RYU, EM99; 0206, W3HH, EN90; 0214, K2PQI, FM09; 0225, WA4GTM, FN11; and 0228, W8ANS, EN91. That is a summary of stations worked. It is the most intense opening that I have worked in 5 years." Lauren, WØLD, DM78, Colorado Springs.

"For general interest and those who want to research the opening, here's what happened from FN02cw 0144, W5SFW, DM95; 0150, N5TML, EM14; 0205, WB5AFY, EM04; 0209, K4YA, EM25; 0210, KO5D, DM95; 0212, WØROO, EM29; 0212, WB5GVC, EM25; 0214, K2DRH, EN41, Tropo, not *Es*; 0215, WDØBWE, EM29, 0217, WA9JML, EN51, Tropo, not *Es*; 0217, NØWVI, EM18; 0217, NN9K, Tropo, not *Es*; 0223, N5NIQ, EM18; and 0224, W5JME, EM15. Nil from Colorado like the guys further south, and (sigh) nil from New Mexico either. Worked all I heard. QRM was fierce at times sorry if I missed someone. Interested in reception reports. 73" Peter, VE3AX, FN02cw.

"Some good 2-meter *Es* into EM64 recently. I had a 2-hour opening last Sunday, a short opening on Wednesday morning, and an opening yesterday. Maybe it'll keep on going this summer." K4MRW. "Only heard and worked two stations here in EM21 but they were good ones. At 0216, WA4HEI, EN65 and at 0218, WA8D/VE3, EN78." Pete, WA5JCI.

"I started hearing 6 shorten up and get very strong about 0000 and started calling cq on 2 meters with no results. At 0145 I was listening to WZ8D/VE3 on 6 and he said he was going to 2. I went over and immediately heard him 20 over. I worked him and posted it to the clusters and other stations started working him. He was in here for over an hour on 2 meters.

I finally worked three other stations, there just was no activity. Stations worked: WZ8D/VE3, EN78; WA4HEI, EN65; W8DOG, EN66; and K2YAZ, EN64.

"I also worked 63 stations on 2 meters from 0016Z to 0113Z 7/7/99. Here is a breakdown of the grids and states I worked: FN42, FN11, FM29, FN32, FN12, EN90, FN31, FN43, FN21, FN41, FN10, FN41, FN10, FN20, FN30, FM18, FM00, FM09, and FM19. States: MA, PA, NJ, NY, NH, CT, RI, MD, and WV." John, W5HUQ, EM35BC.

"I thought I'd share with others what was worked here in the 2-meter *E* opening last night. Around 35 QSOs were made. I spent some time looking for W8TN or W8DT or someone in EM98 as it would have been a new grid. This is the fourth 2-meter *E* opening so far this summer but no new grids yet. Stations worked: 0119, K8RYU , EM99 , Heard; 0123 , K8RYU , EM99, Worked; 0125, KE8FD, EM89;

VHF Plus Calendar

August 27-29	25th Eastern VHF/UHF Conference; see text for details.
September 2	Last quarter Moon.
September 5	Highest Moon declination. Moderate EME conditions.
September 9	New Moon.
September 11-13	ARRL VHF QSO Party.
September 12	Moderate EME conditions.
September 17	Moon apogee and first quarter Moon.
September 18-19	Second weekend of ARRL 10 GHz and above contest.
	44th Weinheim VHF Convention; see text for details.
September 19	Lowest Moon declination. Very poor EME conditions.
September 25	Full Moon.
September 29	Moon Perigee.

—EME conditions courtesy W5LUU.

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0125, WA8CXI, EM99; 0126, KB8ZMJ, EM99; 0135, N8NYE, EN91; 0138, N3JAL, EN90; 0141, K4RTS, FM08; 0149, N8KOL, ?; 0150, WB8XX, EM79; 0151, AA8ON, EM79; 0153, N8XA, EM79; 0154, W3HH, EN90, 5-7; 0155, K1RZ, FM19; 0155, N8LGP, EN81; 0156, K3ZO, FM18; 0157, W3ZZ, FM19; 0158, N3YDT, FM19; 0159, K3SX, FM19, 5-9; 0211, WA3DJG, FN00; 0211, WA4GPM, FN11, 5-9; 0216, WA8RJF, EN91; 0216, K8MFO, EN90; 0217, AA2DR, ?; 0218, W8ANS, EN91, 5-8; 0219, K9EA, EN71; 0220, K3KEL, FN11; 0221, K8ZES, FN02; 0222, W8QXO, EN81; 0225, AI3W, FM19; 0226, N8IR, EN81; 0227, W2DRZ, FN02; 0231, KC8LGL, EM89; and 0258, K1RZ, FM19, after the band was dead for 25 minutes. Sorry I was so concerned about EM98 I forgot to turn on the 222 rig.

"The next day I had another opening. This was number five 2-meter *E* opening of the summer. This one was really different. It was not wild or short. In fact there was very few 8s on 6 m when the band opened to K2ZRJ, FM29 at 2305. TV channels 5 and 6 were not wild either but there was a picture most of the time. It took 4 minutes to work K2ZRJ then it was another 8 minutes till K3ZO was worked. The band was open on and off (mostly on) for 2 hours. Stations worked: 2308, K2ZRJ, FM29; 2317, K3ZO, FM18; 2324, W3ZZ, FM19; 2345, W4PDW, FM18; 2348, K4RTS, FM08; 2358, KN4SM, FM16; 2359, N4CH, FM07; 0008, W4TLM, FM07; 0012, W4CQX, FM16; 0015, W4ENO, FM1?; 0016, W4TLM, FM07; 0018, K4WWA, FM06; 0019, WS4W, FM06; 0039, W4DR, FM17; 0042, W4MYA, FM07; 0050, W4SKD, FM07; 0058, W4CH, FM07, again; and 0103, W4MYA, FM07, again. A phone call was made to CO, WY, and northwest NE but they were out of the opening. No new grids yet this year. I did have EM98 alerted but the *E* cloud drifted the wrong way." Larry, NØLL, EM09, Kansas.

"Worked the following between 2318 and 2321, 7/6/99: K4RTS, FM08; K3ZO, FM18; and W4PDW, FM18. The calling frequency became a zoo with medium range tropo mixed in. I sure wish people would have enough wits about them to know what's going on. Oh well." Jay Hainline, KA9CFD, EN40om.

"Nice 2-meter *E*s opening this evening to MD, NJ, PA, and VA. Thanks to Larry, NØLL, for the "heads up" on Slapshot. I operated mobile running a TR-751A and a halo in EM17. Worked the following on 144 MHz between 2350Z July 6 and July 7 0100Z: K3VGX , FM19; K2TXB, FM29; W3ZZ, FM19; K4RTS, FM08; K9YDH/4? (log got wet); KC4AUF, FM17; K3ZO, FM18; W4MYA, FM07; and N4CH, FM07." Jon, NØJK.

"Nice *E* skip for my first in too many moons. Turned on TV when I got home at 6:15 p.m. ET to find 2, 3, 4, and 5 gone and 6, 7 almost unintelligible. Heard S5 band noise in direction of a big thunderstorm off Hatteras. I called CQ from south to north west until WAØETH popped in at 2315Z. Signals seemed to be clustered in 7 or 8 grids. I worked the following: WAØETH, EM38; WØJRP, EM27; KØETC, EM27; K9IMX, EM38; WØVD, EM27; WØFY, EM48; N5TML, EM14; KM5ES, EM25; WD5GVP, EM25; N5WKW, EM15; KD5VQ, EM15; KD5FDC, EM15; K5SW, EM25; and W5HUQ, EM35. The switch was turned off at 0108 here with no further stations heard. Thanks to all who answered my calls. Now if we could get some rain." Phil, K3IB.

"I worked K5CCT, EM22, and KB5VRO, EM43, with both stations at S9 plus 20 dB. Everybody was congregated on the calling frequency again. I called on 144.210 for a long time with no QSOs. That is two new ones in three years except for meteor scatter." K2SPO.

"I worked VE3ONG (EN92) at 0052 and heard a VA3 but path died before completing. Several minutes later at 0101 worked VA3ARC (EN92) for a quick one. Around 0110 heard VA3IKE (FN14) but again, path died before the QSO completed. Nothing else heard. Sounded more like scatter than *E* skip as contacts were only possible for several seconds and then signals were gone. Others to the north, west, and east of EL49 were reporting *E* skip at the time and 6 meters was wide open to VE1s and VE3s at the time. Great fun whatever the propagation mode was. More, more. Please!" Rick WA5RT, EL49.

"Well, that was fun. Worked 69 QSOs, and 13 grids, from 2326 till 0105. Best DX was FM42 and FM41. I heard lots of folks working and I commend everyone for a polite and well behaved bunch of folks. Patience and a little luck went a long way. I also worked stations all the way from 144.245 MHz down to 144.169 MHz. Good job folks. Let's do it again soon. Brent, N5TML, EM14aq.

"Great E skip opening on 2 meters last night. I found the band open at July 6 at 2312. The band closed at July 7 at 0104. The grids I worked are: FM09, FM08, FM16, FM17, FM07, FM19, FM18, EM99, FM29, FN20, FN30, FN31, FN41, FN42, EN90, FN21, FN11, and FN32. I worked 80 stations in 18 grids. Hope everyone had fun, I sure did." Dan, WØVD, EM27ud.

"I worked EN30, 31, 33, 38, 40, 41, 53 from EM64 this morning on 2 meters. I worked EN53 on 70 centimeters. May stick with us this evening, check those radios." Max, K4MRW, EM64. "I worked into EN31 and EM48 from EM 84. Good tropo signals at 1600 on 8 July." Bob Dodson, WB5APB, EM84. "I worked KØMQS in EN31 here in DM79rj. Dick was the only one on the band. Where was everyone else?" Brian, NØVSB.

"Alerted by Brian, NØVSB, around 1630 that we had 2-meter tropo into EN31, I found Dick, KØMQS, on 144.2. I worked him. A little later Mac, WAØJCE, EN00, was fair copy. Both Brian and I worked him. Then we heard WØOHU, EN34, on CW but couldn't work Mac. Maybe next time." Dave, W6OAL.

"Also alerted by NØVSB, I worked KØMQS here in DN70. Was called by a couple of others but no other QSOs. Probably not much of an opening compared to what other locations experience. But in my 4.5 years on 2 meters this is the first opening I ever caught in tropo poor Colorado. So it's really something unusual." Jay, KØGU, DN70mq.

During the same period of the sporadic-*E* and tropo openings in the other parts of the country, the west coast was experiencing tropo ducting to Hawaii. For several days in early July, Paul gave out a number of contacts from his volcanic location. The bands also opened around mid-July, just about the time that I was concluding this column.

6-Meter Opening to JA from SD

The following is from Arliss, W7XU: "I was able to get on 6 m this evening at 2330Z and heard strong signals from VE7 and

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VE6. At 2340 I copied the KL7FZ beacon (BP51) 549 on 50.090. My CQ on 50.110 was answered by a weak CW station (NL7Z ?), but that was interrupted by a SSB call from JA4MBM, whose report was 33 here. We completed at 2348.

"I subsequently heard bursts of signal from Japan (including JH6VXP?), but the only other station I worked there was JH6NKZ at 0005Z (signal report for him 43). I lost one or two QSOs due to state-side stations calling me over the top of JA's (in the DX window). The antenna was pointed on the great circle path to Japan for these QSO's.

"My wife, Holly, NØQJM, worked JH6NKZ at 0008Z and JA4MBM at 0015Z. JA4MBM at that time was 5 by 4—the strongest at any point during the opening. He was also the last JA signal heard here.

"I presume this was multi-hop sporadic-*E*. Although I've worked Europe before on multi-hop sporadic-*E*, this was the first time I've heard or worked Japan via *Es*. The JA path is about 6,000 miles, or roughly 1,500 to 2,000 miles longer than the path to Europe from here. I never did work a KL7 during the opening."

HV4NAC EME Report

The following is from Wolfgang, DL5MAE: "Here are the results from my HV4NAC-activity:

"The 2 x 17-el were built up in the garden of the North American College. Many thanks to Ugo (IØCUT) for his great assistance in assembling the array. It was nice to meet Ugo after almost 20 years again!

"My special thanks goes of course to Francesco (IKØFVC) and his family for let me operate at HV4NAC. Of course, many thanks to Enrico (IKØBZY), who helped a lot to get the possibility to operate from Vaticano. Finally I got also nice help from Renzo (IØGKP) while disassembling the array. Especially I want to thank the people from the North American College who allowed me to operate from there!

"On EME I worked 25 stations. My operation was very limitted because of the terrible QRM situation! The QRM was almost in all directions S9+. So I was only able to operate at 210 deg–250 deg AZ. For all other directions it was impossible to do EME! Besides EME, I was also operating HSCW-MS with a 9 el Yagi on the top of the building. The QRM situation was a bit better but still very bad in some directions. I was able to work 23 stations on MS. Besides this I worked about 90 QSOs via *Es* (UA6, YO, ER, UR5, YU, SP, ES, LY, OH).

"For EME I was forced to turn the antenna 'somewhere' approximately to the moon to get the QRM reduced to a minimum. So receiving was extremely hard with QRM and not pointing to the moon exactly...TX was nice: I was able to run the full power! Sorry for my endless CQs and QRZs."

"Here is the list of stations heard /called /worked: KB8RQ, WØHP (NC= called him 3 times but only 3 half QSOs...bad luck!), K2GAL, HB9Q, OZ1HNE, W5UN, W7GJ, VE7BQH, SM2CEW, SM5BSZ, RU1AA, K6MYC, SM7BAE, F3VS, DJ5MN (@DL5MAE-stn), SM5FRH, VE3KH, IK3MAC, I2FAK, UA4API (NC= Sent O but missed RO or RRR...QRM), OK1MS, DF4MAA (@DL5MAE stn), DL7MAT (NC = sent O , then disappeared), GM4JJJ, K1CA, K5GW, W5LBT, and I3DLI. QSL-info: via IKØFVC, Francesco Valsecchi, Via G Bitossi 21, 00136 Roma, Italy. Please provide sufficient postage/IRCs."

Current Contests

The ARRL September VHF QSO Party: This contest is scheduled between 1800

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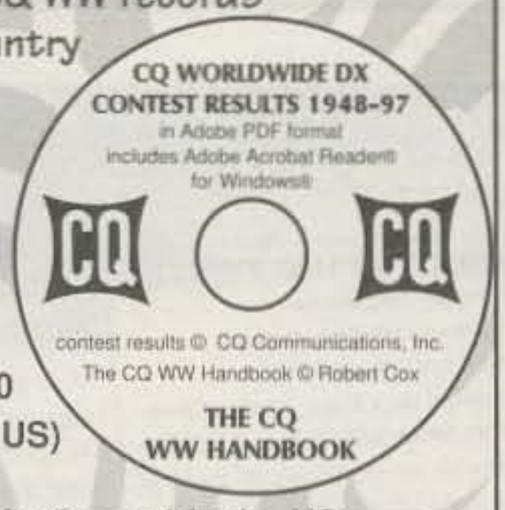

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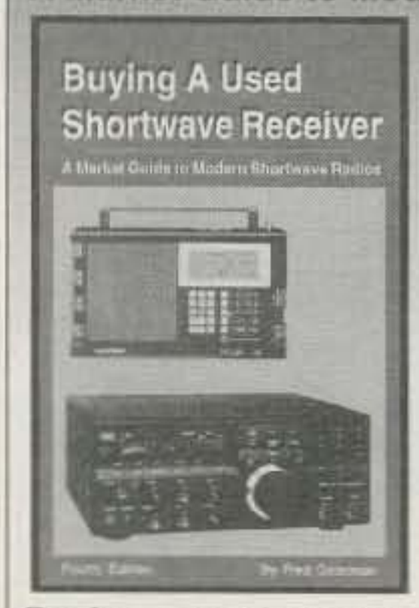

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UTC, Saturday, September 11, and 0300 UTC, Monday, September 13. Complete rules can be found in August *QST*. The ARRL 10-GHZ and Above Contest: The second weekend of this modified contest is 18–19 September, from 8 a.m. to 8 p.m., local time. More information on the rules changes can be found in last month's column and June *QST*. Both of these contests' rules and log sheets can also be found on the League's home page.

If you have not yet sent in your logs for the CQ WW VHF contest, please do so by 31 August. Preliminary reports indicate that participation, while restricted by propagation, was up during this year's contest.

Current Meteor Showers

Two minor showers, the Piscids (two peaks, 8 and 21 September) and the Aurigids (30 September) can be seen this month. However, their activity has not been much above what is considered sporadic activity.

Current Conferences

The following is from Bruce Wood, N2LIV: "The 25th Eastern VHF/UHF Conference: Harley Hotel Enfield, CT August 27–29, 1999 As a result of a lot of hard work by your committee, we will be having an excellent full program this year. An effort was made to improve our conference by carefully evaluating the critiques we received last year. This year's program is a result of that input. This year, we have speakers from New England to as far south as Maryland and as far west as Ohio. Many people missed having the Band sessions, so we brought them back this year! We'll have a Technical Laboratory and Demos area which will be in operation Saturday afternoon, managed by Don Twombly WB1FKF. We encourage you to bring a project to de-bug or tune with some newer type test equipment. We'll also have Gerry Rodski, K3MKZ of SSB Electronic & N1DPM to manage the preamp noise figure measurement workshop (50 MHz–10 GHz); and Joe Reisert, W1JR to manage the antenna gain measurement range (222 & up, entrants receive a hardcopy plot of their antenna). A great opportunity to check out your preamps and antennas! This years' VHF-SHF Trivia Quiz will be hosted by Dale Clement AF1T. An ARRL published *Proceedings* book with the event schedule and many interesting articles is included with your registration and will be presented to you when you arrive. Hope to see you soon! Bruce Wood, N2LIV, Conference Chairman and *Proceedings* Editor,3 Maple Glen Lane, Nesconset, N.Y. 11767-1711; 516-225-9400, Work; 516-265-1015, Home; E-mail: bdwood@erols.com."

The following is from Volker Breitlow, DG2VB: "The 44th Weinheim VHF Convention will be held in the 'Mannheime Maimarkthalle' on 18–19 September 1999.

"Run by members of the Weinheim office of the DARC in their free time, the VHF Convention really is an 'amateur' event, which means that it is quite possible for changes to take place in the date and location, as has been the case this year. We would like to take this opportunity to apologies to any of our guests who have suffered any inconvenience as a result of this.

"But things can really get going now: after night-long discussions and lively negotiations, we have now come up with the perfect setting for the 44th VHF Convention. The 'Maimarkt' exhibition and convention center is directly accessible from the 'Mannheim Mitte' motorway intersection, which is around 10 km away from Weinheim. There should be not problem accommodating all of the daytime events inside the hall or neighboring convention center during the opening hours.

"The evening meetings will be taking place in Weinheim. Our Hamfest will be held at the DLØWH clubhouse whatever happens. Early arrivals will again be gathering on Friday evening and the campfire will be lit as usual on Saturday evening. The meadow next to the clubhouse will be mowed again, of course, to ensure that there is adequate room for all campers. Please let us know if you are intending to spend the night here, so that we can ensure that sufficient space is available.

"If you prefer a high-quality evening meal in a romantic atmosphere, then the Weinheim marketplace is the venue for you. You could enjoy better service than usual this year.

"Although the journey from Weinheim to the Mannheim exhibition center is slightly longer, you will not have the parking problems that have accompanied this event in the past, having to catch a shuttle bus to travel backwards and forwards. A bus will be travelling from the clubhouse to the exhibition center at 7 o'clock on Saturday morning. The frequency 145.550 MHz will also be used to organize lifts (so please bring your handheld 2 m radio with you rather than your mobile telephone).

"The large hall (as large as the entire exhibition center in Weinheim) and the convention center will be available to us on the "Maimarkt" premises. We will not be using the space outside. The commercial exhibition and the flea market will be accommodated in the hall. The exhibition will be opening at 9 o'clock each morning.

"One of the real Weinheim traditions is being revived: the flea market will be free of charge! Anybody buying a two-day admission ticket will be entitled to occupy 3 meters of flea-market space. The doors

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will be opened at 6 o'clock on Saturday and Sunday morning for this. Please bring your own tables and trolleys to transport your goods as there will be no direct access to the hall for vehicles! Electricity will be available to those who come armed with extension leads and cable drums. It will not be possible to sleep inside the exhibition center or in the carparks!

"The special activity groups will be meeting in bright new rooms in the adjacent building. There will be several lecture rooms of varying sizes available, which means that the program can remain fairly flexible. Separating the lectures and special activity groups from the exhibition means that discussions can take place in a relaxing, fruitful atmosphere whereas the close proximity of the various areas allows visitors to move easily between the lecture rooms and special activity groups.

"For more information, surf to http://www.ukw-tagung.de. Please address any queries to the office (Silke, DL2IAK): UKW-Tagung Weinheim, Birkenweg 49, D-69469 Weinheim, Germany. E-mail: DF0UKW@amsat.org; Fax: ++49(0)6201 / 59 20 92; Tel.: ++49(0)6201 / 59 20 91.

"Wishing us all success: Convention Manager Volker Breitlow, DG2VB"

George Elliott, VE2LI, SK

The following is from Joe Reisert, W1JR: "I am very sorry to report that George Elliott, VE2LI, of Montreal, Quebec, Canada passed away at the age of 83 on Canada Day, July 1, 1999 after suffering from a massive heart attack the previous week. He was predeceased by his wife of 42 years, Kay Elliott.

"George was born in the UK in 1915 and worked in the engineering department of the BBC (British Broadcasting Company). He was first licensed as G5LI in the mid-1930s. In his early amateur radio days he enjoyed HF DXing working the rare AC4YN and others.He also worked W6s on 80-meters from the UK in the late 1940s when this was a rare occurrence.

"He emigrated to Montreal in 1951 and joined the CBC (Canadian Broadcasting Company) where he later was a supervisor in the Transmission Systems Division until his retirement in 1979. He became a very avid VHF DXer working 144, 432, and 1296 MHz. He was a real home-brewer, who built all of his equipment.

"George had an acute hearing problem and was not able to hear much below 2000 Hz. except with a hearing aid. As a result, he operated almost exclusively on CW, enjoying long haul trospheric and aurora propagation. His most treasured contact was to be one of the few amateurs to work KP4BPZ in Arecibo, Puerto Rico on 432 MHz. EME in 1965 before EME contacts were commonplace.

"In 1976, I introduced him to amateur satellite operations and George became an avid operator on OSCAR 7 and 10 and other LEO (Low-Earth-Orbiting) satellites until a few years before his death. He was the first person to obtain a WAC on OSCAR 7, and soon completed a satellite DXCC.

"In George's later years he preferred to ragchew with HF DX, especially on 30 and 80 meters. His favorite operating time was very late at night when he would work many Europeans at their sunrise.

"I first worked George on HF in the mid-1950s and have known him personally for over 25 years. We exchanged yearly visits and took family trips together in New England and Quebec. George and Kay loved the ocean. I miss him very much, especially our weekly CW schedules on 144 and 432 MHz.

"A memorial service for George will be conducted in Montreal, Quebec on Friday, July 7, 1999."

And Finally

Farewell to a wonderful ham: A really good friend of mine is now having QSOs in Ham Heaven. Alan Dorhoffer, K2EEK, became a Silent Key on July 19, 1999. Al will always be special to your columnist because he gave this then-unknown author a byline in a national magazine a few years ago and it has been an honor being your columnist ever since then.

Over the years, Al and I had several chats via the landline and a few in person. I never had the opportunity to e-mail him. I also never talked with him on the air. Yet his voice, with that resonant New York accent, is as clear to me today while I am writing this as it was the last time we spoke.

Al was a stoic voice for amateur radio, always holding a middle ground against extremes and excesses in our hobby and stressing the fun aspect of amateur radio. His editorials sometimes took a controversial stance, but whatever he said had to be said to us at that time.

Al will be truly missed by so very many of us in the hobby. One concept of eternity is to keep the good memories of the deceased person alive. In my heart, and the hearts of so many of us in the fraternity, good memories of Al's contributions will always be with us. 73, Joe, N6CL

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Packet User's Notebook

BY BUCK ROGERS, K4ABT

Connecting You And Packet Radio In The Real World

The MFJ-1278B/DSP

MFJ now combines the "brick wall" DSP filters with their multi-mode data controller, the MFJ-1278B/DSP.

One of the fun ingredients of packet radio is the ever-changing structure of our hobby. Each new "Packet User's Notebook" column that you read is written only after I've experienced the topic expressed in the column.

I don't write this column until I have tried and enjoyed the new application or product(s) that I write about. The latter is the most important, because were it not for the intense enjoyment that we receive from our digital communication experiences, we probably would delve into another facet of the hobby to occupy our tireless search for mental challenge. This month's topic presents that challenge.

Digital Communications and The All-Mode Controllers

Lately, I notice there is an increase in the use of packet radio, and the trend doesn't stop there. Many amateurs are using packet as a resource for spotting DX. The DX spotting networks are buzzing. However, something I have not seen before is that on these networks the users are also sending notes of a DX station at such and such a frequency operating PACTOR, RTTY, AMTOR, etc.

In short, they are identifying the mode of operation that other potential DXers should look for. Thus, the trend is for the HF (and VHF) amateur to look into or decide whether to make a purchase of an "all-mode" digital controller, or a stand-alone Terminal Node Controller (TNC). Judging from the gist of the e-mail I am receiving, the users are asking more and more about the use of the "all purpose" or "multimode" digital controllers.

These controllers fall into a category that transmits and receives other digital modes distinct from packet, such as PACTOR, AMTOR, RTTY, CW, FAX (WeFax), Slow Scan TV, and NavTec. They also offer multiple ports for VHF and HF operations. The MFJ-1278B is one of the top "multi-mode" contenders for an "all-mode" controller.

When We Talk About Multi-Modes

When we talk about multi-modes, we are talking about ten digital modes plus DSP, Packet, PACTOR, AMTOR, RTTY, Color SSTV, 16-gray level FAX / Weather FAX, ASCII, Navtex, CW, and Memory Keyer.

MFJ now combines the "brick wall" DSP filters with their multi-mode data controller

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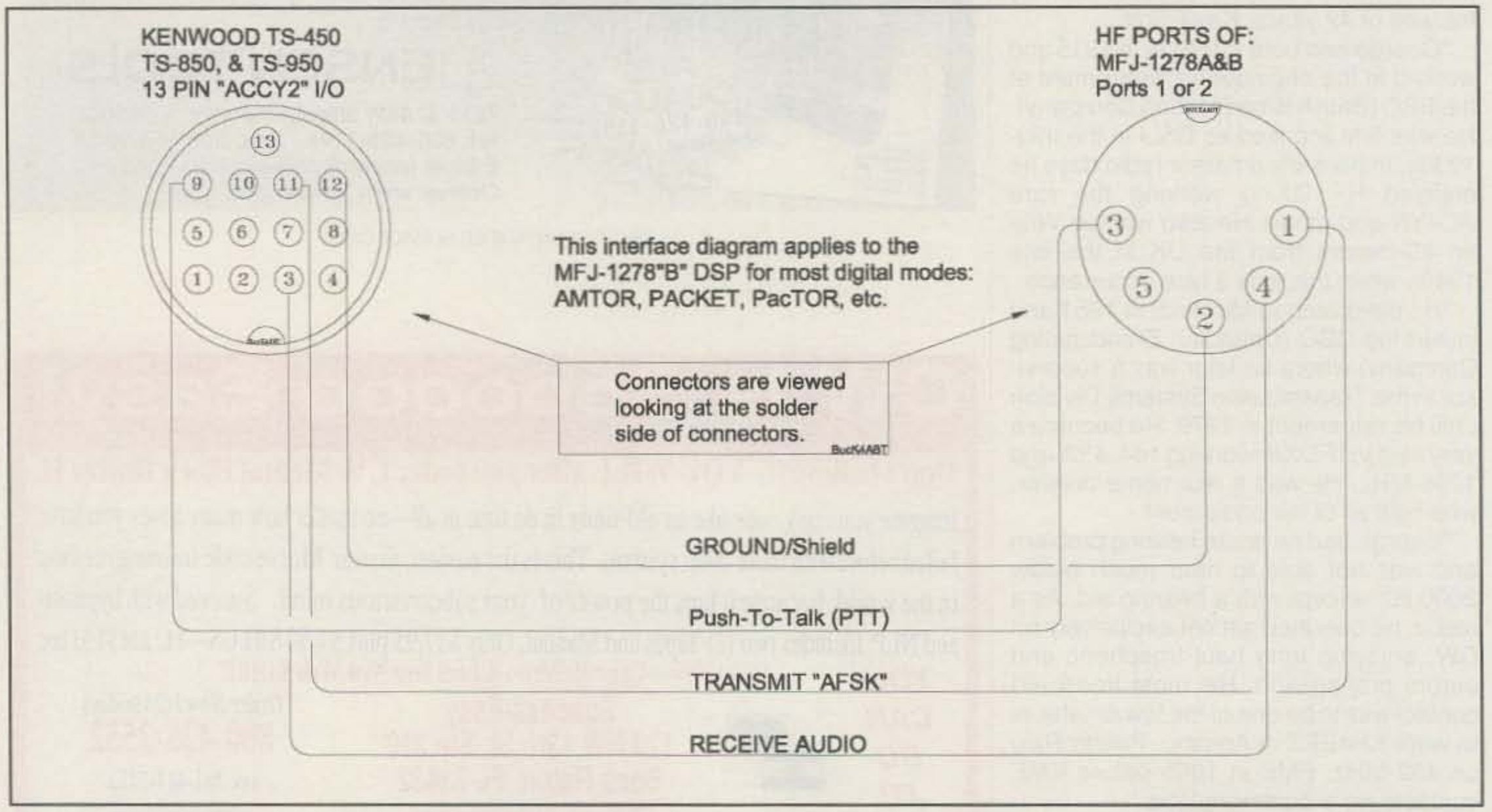

Fig. 1– An illustration of how the MFJ-1278B is interfaced to the Kenwood TS-450, TS-850, and TS-950, 13-pin DIN, accessory port 2 (ACCY2). When using this configuration, the proper operation "mode" should be selected as described in the text.

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HF and VHF Operation

Once the radio to MFJ-1278B interface cable is wired properly, connect the 5-pin DIN end to either Radio port 1 or Radio port 2 of the MFJ-1278B. Connect the other end to the radio. The radio ports are not dedicated to either HF or VHF operations. Radio ports 1 and 2 are exactly the same. Either port can be delegated for HF or VHF operation. HF and VHF operation are accomplished via a simple software-executed switch.

FYI: MFJ also offers optional pre-assembled cables to connect the MFJ-1278B to most radios. Contact your MFJ dealer or MFJ themselves for more information about these cables. A few of the availablecables are listed here:

- MFJ-5084 for MFJ-1278B to most ICOM 8-pin radios.
- MFJ-5086 for MFJ-1278B to most Kenwood and Alinco 8-pin radios.
- MFJ-5080 for MFJ-1278B to most Yaesu 8-pin radios.
- MFJ-5024 for MFJ-1278B to most ICOM/Yaesu/RadioShack HTs.
- MFJ-5026 for MFJ-1278B to most Kenwood HTs.

As an example of how either of the two radio ports of the MFJ-1278B can be wired, I've drawn an illustration for the MFJ-1278B to the Kenwood(s) TS-450, TS-850, and TS-950, 13-pin DIN, accessory port 2 (ACCY2). (See fig. 1.)

Specific wiring diagrams for many Kenwood, ICOM, and Yaesu radios are shown at the end of the "FAST-START™ manual that is included with the MFJ-1278B.

If You Love CW As Much As I Do . . .

There are some other possible connections that you may wish to make to your MFJ-1278B. If you are a CW buff as I am, one of those connections is for CW Keying. Connect a shielded audio cable from the CW Keying Out jack of the MFJ-1278B to the Key input of your radio. The factory setting for the keying output of the MFJ-1278B is "Direct keying" which will work for most solid-state-type radios. If your radio is the type with tube finals, then you will want to use the "Grid Block" keying. To set up the Keying Output of the MFJ-1278B to "Grid Block" keying, you must move the shorting jumper of JMP 22 on the MFJ-1278B motherboard to posi-

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tion 1 and 2. Wire the CW keying cable as shown in appendix "G" of the MFJ-1278B instruction manual.

Command and Menu Driven

The MFJ-1278B is both Command and Menu driven, which enables operational flexibility and ease of use, although most of the factory default settings of the MFJ-1278B commands allow you to operate any mode available.

But, first and foremost: Before you start to use your new MFJ-1278B, you must first enter your callsign into the MFJ-1278B memory.

To set your callsign into the MFJ-1278B, at the command (cmd) prompt, please type:

MYCALL xxxxxx <CR>

xxxxxx is your amateur callsign, and **<CR>** means to press the "Enter," or "Carriage Return" key on your computer keyboard.

Changing the Operation Mode

Use the Mode command to change operation mode of the MFJ-1278B. The format of the Mode command is:

MODE xx,bbbb,m

where, **xx** is the operation mode, **bbbb** is the radio baud rate or speed, and **m** is the modem selected to be used for that mode. In most cases you will not need to specify the modem (**m**) to be used. The defaulted modem will be matched automatically to the mode of operation by the MFJ-1278B.

The Mode command is very easy to use. Below are a few examples as to the use of this command to change modes:

Using the Mode Command

a. To enter the CW mode at 13 wpm, type: **MODE CW,13 <CR>**

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• Normal or reverse FSK output

Operational Mode	Abbreviation Mode
VHF Packet	MODE VP
CW & Memory Keyer	MODE CW
HF Packet	MODE HP
Modulated CW	MODE MC
RTTY 850 Hz Shift	MODE VB
RTTY 170 Hz Shift	MODE HB
ASCII 850 Hz Shift	MODE VA
ASCII 170 Hz Shift	MODE HA
PACTOR	MODE PT
AMTOR and Navtex	MODE AM
SSTV	MODE TV
FAX	MODE FX

Table I– Abbreviations of the MFJ-1278B operational modes.

If no radio baud rate or modem is selected, the MFJ-1278B will use the defaulted radio baudrate/speed and modem.

b. To select the 300 baud HF packet, type: **MODE HP <CR>**

The MFJ-1278B will be set to operate 300 baud HP packet.

c. To enter the 1200 baud VHF packet, type: **MODE V <CR>**

The MFJ-1278B will be set to operate 1200 baud packet.

d. To enter the PACTOR mode, type: **MODE PT <CR>**

The MFJ-1278B will be set to the PACTOR mode of operation.

Changing Modes with "SET menu"

We mentioned earlier that the MFJ-1278B is Command and Menu driven. The Set menu is used to change several different operational parameters. For a listing of the Mode abbreviation, type:

SET <CR>

Verifying the Operational Mode

Using the Mode command the operational mode is easily verified. Try typing:

MODE <CR>

Changing the Radio Port

The radio port of the MFJ-1278B can be easily changed at any time. Try typing:

R 1 <CR> for radio port 1 or
R 2 <CR> for radio port 2

All operational modes of the MFJ-1278B have abbreviations. These abbreviations make the unit easier and faster to use. The abbreviations are used in conjunction with the Mode command. In Table I I've included a list of all operational mode abbreviations.

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Wrap Up

Features of the MFJ-1278B/DSP are listed in the accompanying sidebar. The unit features the MFJ "No Matter What Guarantee," which is a trademark of MFJ Enterprises, Inc. Up front, MFJ offers the one-year unconditional guarantee which states that MFJ will repair or replace your MFJ-1278B (at their option) "no matter what" for a full year.

The unit is priced as follows: MFJ-1278B/DSP $379.95; MFJ-1278B w/o DSP $299.95; MFJ-1278B $299.95, no DSP; MFJ-1289W $59.95, *new* MultiCom™ for Windows.

For more information about the MFJ-1278B, contact your favorite MFJ dealer, or MFJ Enterprises, Inc., Box 494, Mississippi State, MS 39762, or call 800-647-1800, fax 601-323-6551.

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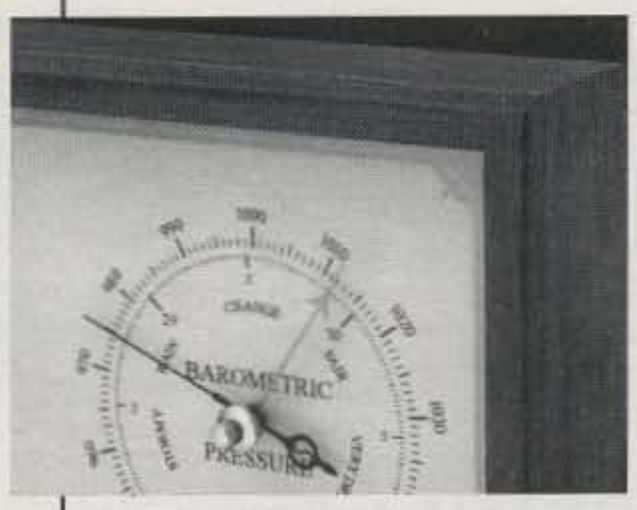

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World Of Ideas

A Look At The World Around Us

BY DAVE INGRAM, K4TWJ

Mobiling '99: New Interests and Ideas Abound—Part II

As you will recall, last month's column overviewed mobiling '99 from the more traditional standpoint and presented a variety of ideas for setting up a neat HF station in your car. It also hinted that some special views and unique ideas would be forthcoming in Part II. Well, that is precisely what is on tap for this month, as we move off the beaten path to explore some captivating pursuits you do not see every day, such as VHF SSB operation, OSCAR mobiling with only a dualband FM rig, and even "walking mobile." We have some exciting ground to cover and some very impressive new goodies to show you along the way, so let's get started!

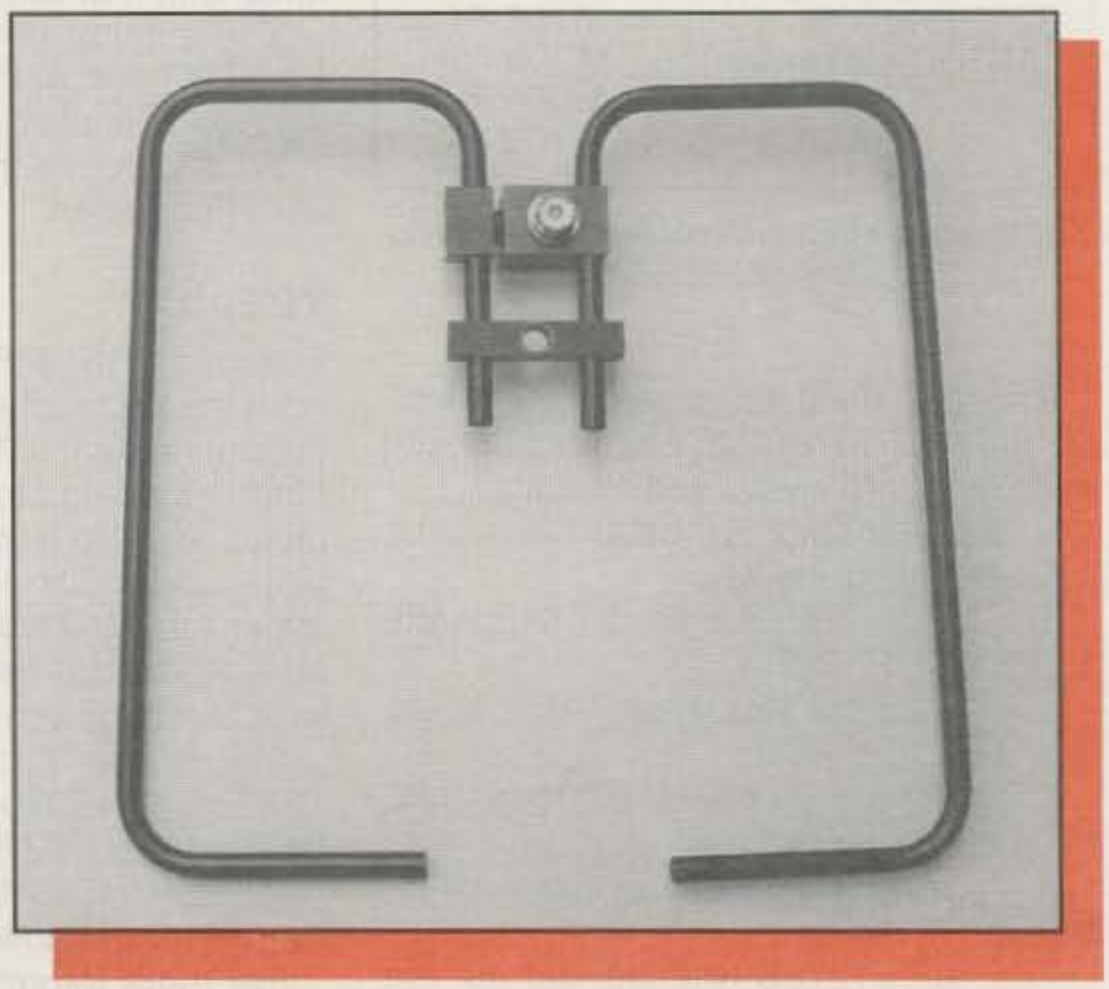

Photo 1– The new M² "HO" loop antenna for 2 meter SSB/CW operations prior to installation. It is horizontally polarized, omnidirectional, exceptionally well-made, and a stout signal radiator.

New Frontiers Beckon!

As you probably have noticed, an increasing number of HF mobile transceivers are including all-mode 6 meter, 2 meter (and even 70 cm) in their operating capabilities. Combining everything in one cabinet is a clever idea. However, it also makes me wonder how many amateurs use these super-deluxe rigs on VHF or UHF for more than regular repeater activities. What else is out there, you ask? Weak-signal SSB mountaintopping, high-speed CW operating, grid-square expeditioning, and meteor shower DXing are a few of the areas that immediately come to mind, but that's only a sampling. These SSB/CW activities are a world of their own—a world with so many special pursuits they overfill each monthly issue of *CQ*'s sister publication, *CQ VHF*. Check out a few issues! This area is gaining momentum at a phenomenal rate and is growing like wildfire!

One of the big differences between FM and SSB or CW operations on VHF or UHF is the communications range. Rather than just chatting with local friends, a good mobile setup typically reaches out 100 to 150 miles, or more. Say you occasionally tune the CW and SSB range of 144.0 to 144.250 MHz, but do not hear any activity? That makes sense. SSB and CW stations use horizontally polarized antennas, and trying to copy them with a vertically polarized whip or antenna like that used for FM results in a 10 to 20 dB signal loss. If stations are a fair distance away and already weak, an additional 10 dB drop can put them below a band's noise level. You never realize they are there. Switch over to a horizontally polarized antenna, however, and you may be pleasantly surprised with all the new-found DX action, especially during contests. Try it!

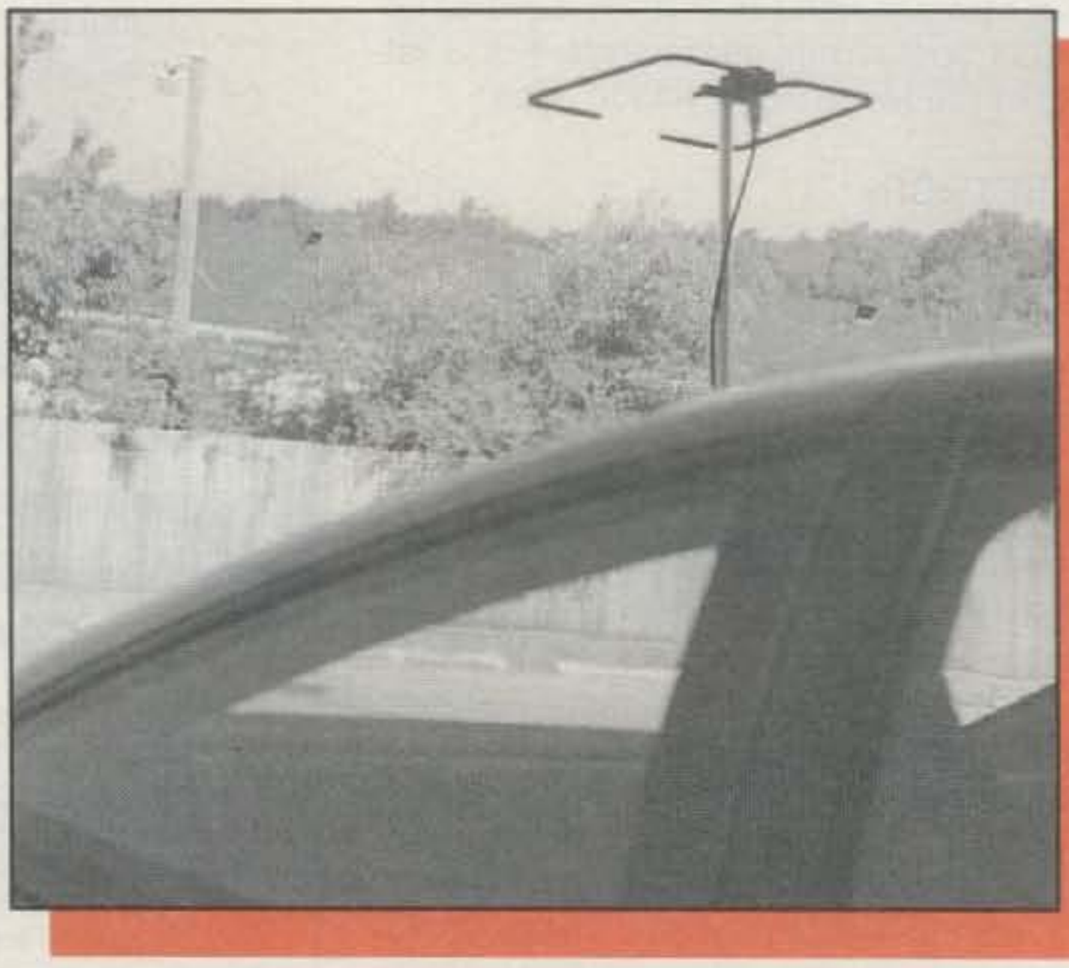

Photo 2– The M² 2 meter "HO" loop trunk-mounted on an optional M² mast and ready for action. Like the classic "Squalo," this gem is equally suited to fixed, mobile, or portable operation.

New M² Loop Antennas

The mention of horizontally polarized antennas usually inspires visions of collapsible dipoles or snap-together beams—not too appealing antennas for in-motion or brief-stint mobiling. We really need something more akin to the classic "eggbeater" or "squalo" for convenience.

Well, friends, check out M² Antennas' new "HO" loop (photos 1 and 2). This gem is small, rugged, easily adjustable for low SWR, and available in 6 meter, 2 meter, 222 MHz, or 70 cm versions. HOs (which, incidentally, is an acronym for Horizontally polarized and Omnidirectional radiating loop) are equally suited for home, mobile, and portable use, and they will handle up to 800 watts of power. A 6 meter HO measures 30 inches square per side, a 2 meter HO is 11.25 inches square per side, and a 70 cm HO is 4.25 inches square per side. HOs are made of 3/8 inch diameter aluminum tubing and have weatherproofed feed blocks that defy abuse. Standard versions are silvery-aluminum, but for a couple of dollars more you can get them in gold, black, blue, or green anodized aluminum for total class. HOs are

4941 Scenic View Dr., Birmingham, AL 35210

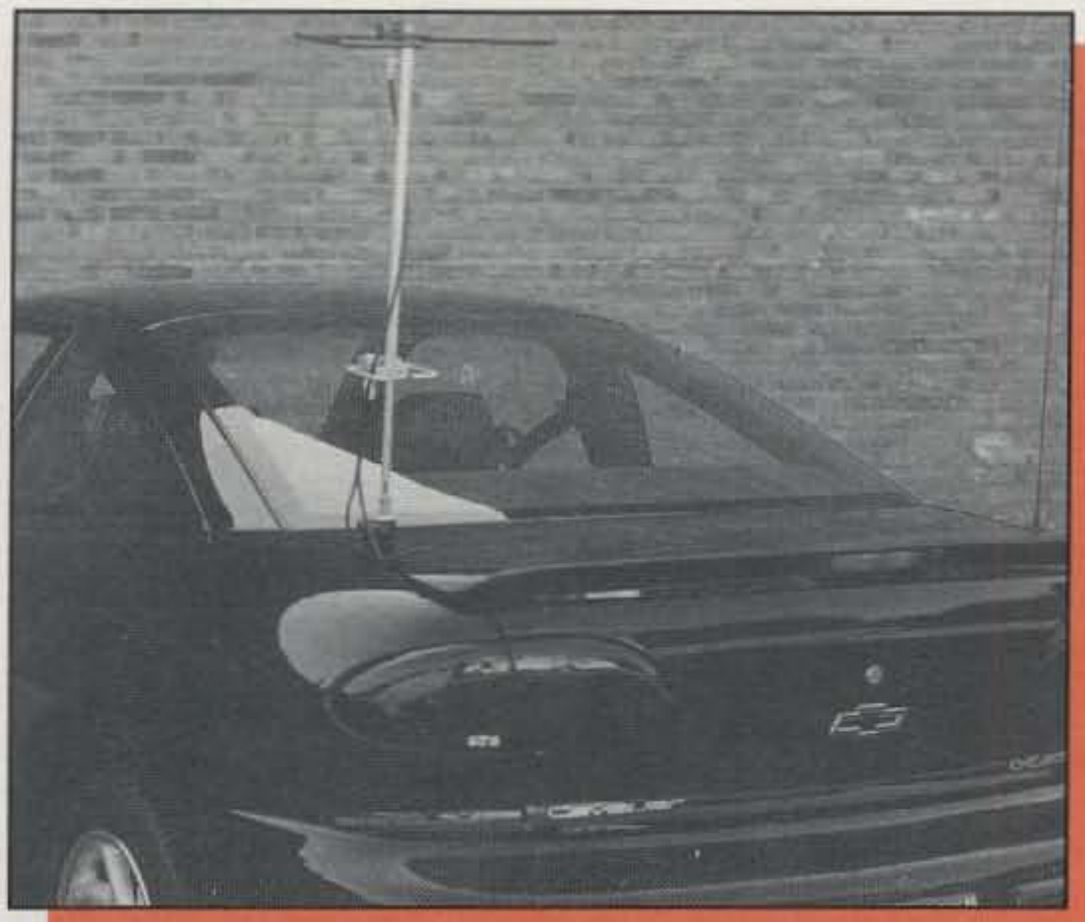

Photo 3– Stacked 70 cm and 2 meter M² "HO" loops mounted above the car's trunk lid and ready to catch an upcoming AO-27 pass. The metal trunk lid acts like a reflector and gives the loop real clout. Now this is mobiling fun supreme!

mounted by a regular 3/8 by 24 thread bolt inserted through a hole near their feed block. Typically, this bolt attaches to an optional support mast which also screws into a regular 3/8 by 24 thread mobile antenna mount.

If you really want to go first class, stack a pair of HOs for extra horizontal gain. Alternately, assemble two or three "inverted, Christmas-tree style" for multiband mobiling. Stacking harnesses, masts, and base mounts (plus HO loops!) are available from M² Antenna Systems, Inc., 7560 N. Del Mar Avenue, Fresno, CA 93711 (phone 559-432-8873, website <www.m2inc.com>). Gordon West, WB6NOA, also wrote a feature review of HOs that appeared in the May 1999 issue of *CQ VHF*. Check it out!

OSCAR Mobile—With Your FM Rig!

Although surely an inaccurate rumor, I hear many of our friends only have a 2 meter/70 cm FM transceiver for mobiling—and it gets miniscule use except during hamfest times. Life in the FM lane includes more than freeway reports and/ or repeater chats, gang. Yes, and the horizon-expanding opportunities are as close as your (FM) rig's tuning dial—well, almost as close. Those M² HO loop antennas come back into the picture here, and the combination gives you coast-to-coast coverage with a mile-mannered FM mobile rig. Really!

"Work an OSCAR satellite while mobile?" you ask. "Isn't that tricky and aren't power-extravagant modes such as FM taboo on OSCARs?"

Transmit/Uplink	Receive/Downlink	
145.845	436.805	AOS
145.850	436.800	
145.850	436.795	Middle of pass
145.850	436.790	
145.855	436.785	LOS

Fig. 1– Frequency relation chart with doppler shift corrections for AO-27. Place a copy of this chart by your mobile rig for quick-reference during passes. (More info in text.)

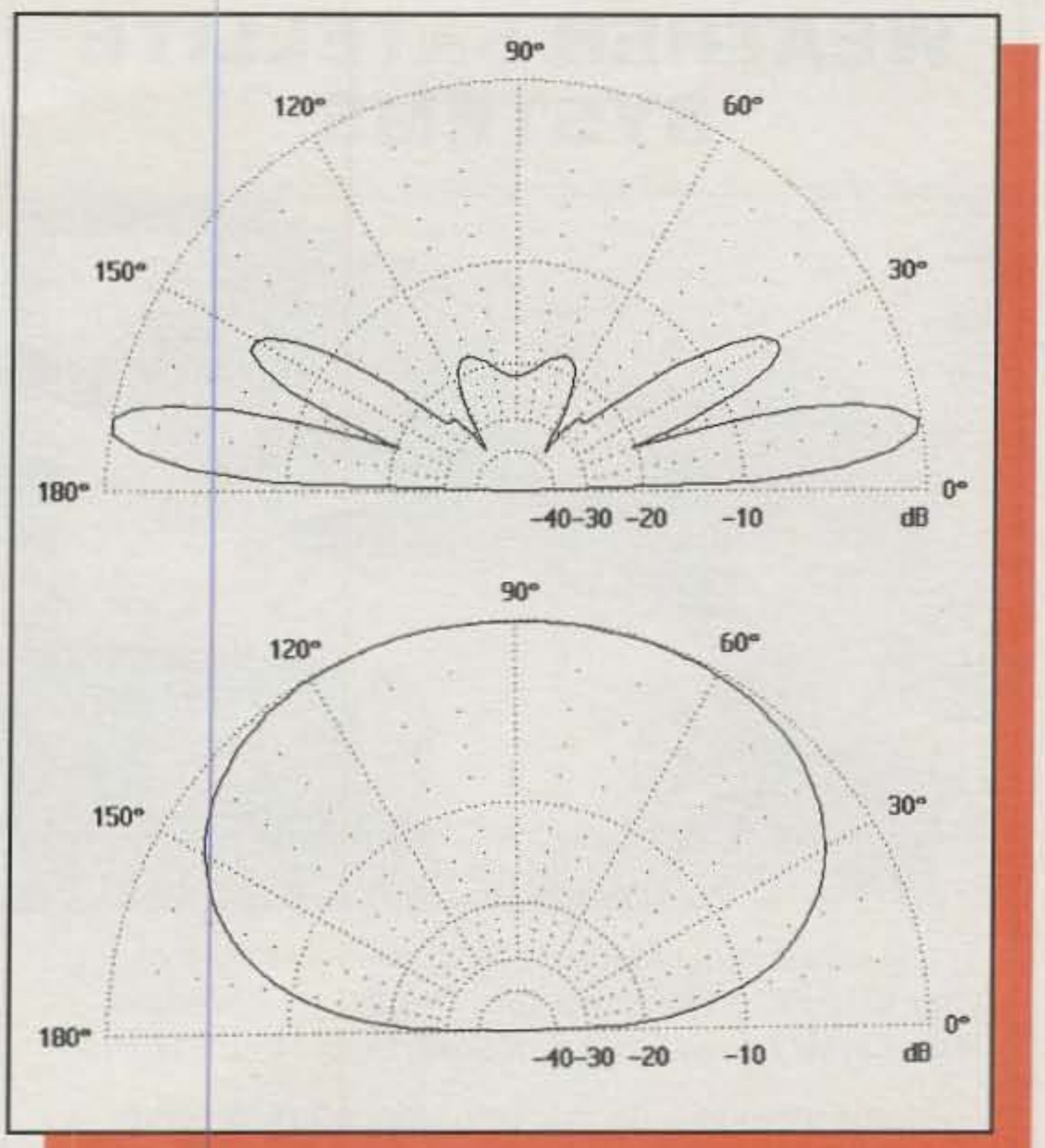

Fig. 2– Comparison of signal radiation patterns for an M² "HO" loop antenna mounted several feet above a car's trunk lid for 2 meter SSB operation (A) and 18 inches above the trunk lid for OSCAR (B). (Discussion in text.)

Normally yes, but two newer satellites, AO-27 and SO-35, are specially designed to be experimental "repeaters in the sky." The keynotes to using them are sharing repeater time (in seconds, not minutes) so everyone can experience satellite fun, and operating effectively—just like you would in a fast-paced contest or pile-up (in and out—kabaam).

Limited space in this month's column demands that I only "hit the high points" of this exciting game, so read carefully to extract all basic and pertinent details in the following sentences.

First, AO-27 typically makes 12 orbits per day, two or three of which are in range of your QTH. These orbits usually fall (no pun intended!) between 10 AM and 1 PM, your local time, when AO-27 is traveling from northeast to southwest. Using AO-27 thus involves knowing precisely when it is in range of your QTH and if its on-board repeater is accessible for operation. The most convenient way to fill these needs is with a computer tracking program available from AMSAT (P.O. Box 27, Washington, D.C. 20044 <http://www. amsat.org>). You then initialize the program (and learn of satellite operating schedules) by data and news from the Internet or the AMSAT net that meets on 14.282 MHz Sundays at 1900 GMT.

Next, you need to know AO-27's operating frequencies and some tried-and- proven tips for success. As shown in fig. 1, AO-27 receives/inputs on 145.850 MHz ±doppler and transmits/outputs on 436.795 MHz ±doppler. A pass is 12 to 15 minutes long, so you must doppler-correct frequencies every 2 minutes (do not try this while in motion!). You also must know when your signal is being satellite-relayed, when the repeater is clear, and when you should use low power to avoid being a "hog." In other words, you must operate full duplex style, simultaneously listening (with earphones to avoid feedback) on 70 cm while transmitting on 2 meters. Those are the basic facts. Additional notes and tips galore are in my *CQ VHF* "How It Works" columns for

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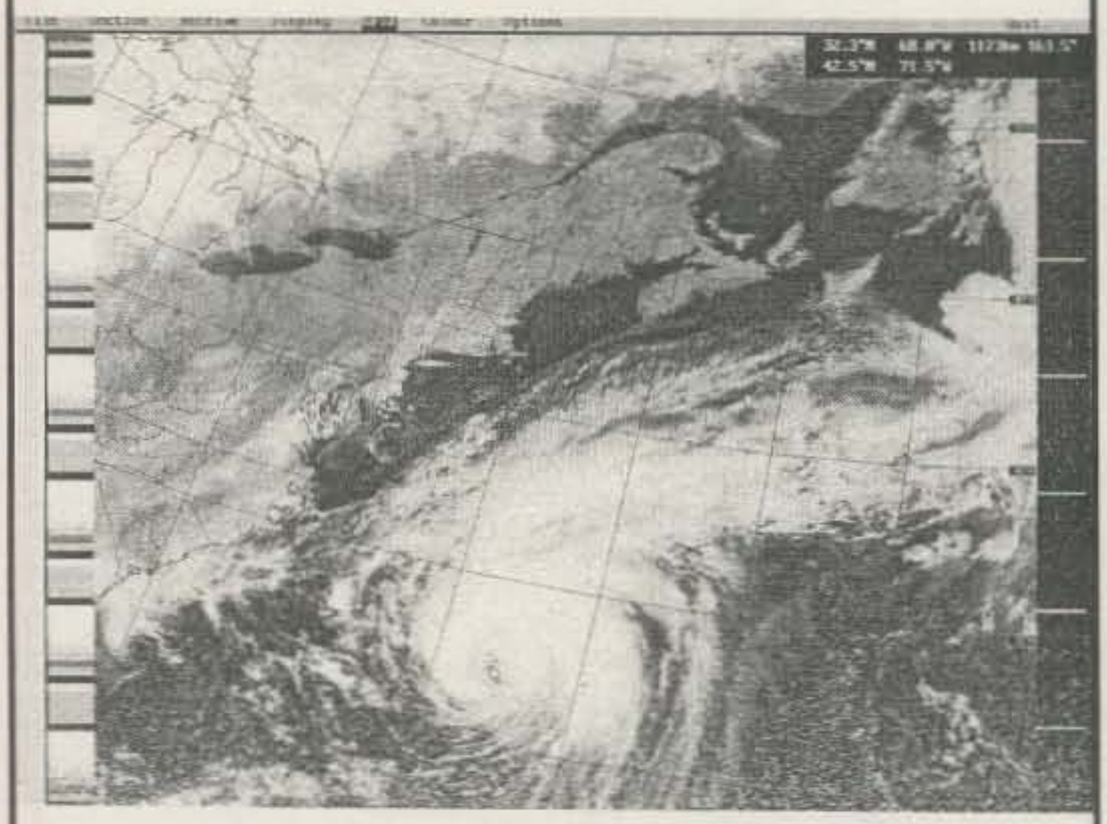

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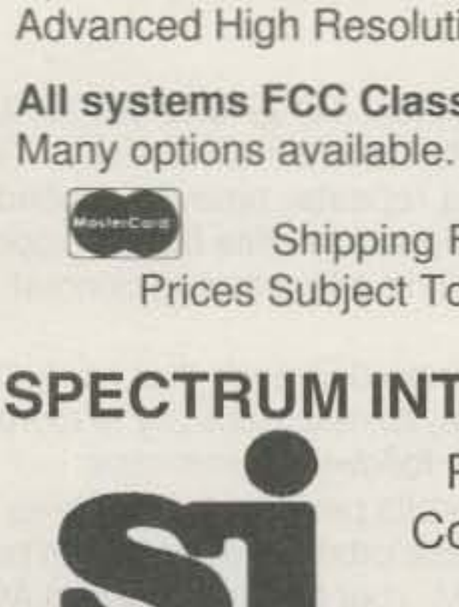

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Photo 4–Ultralight "walking mobile" HF setup that Dennis Foster, KK5PY, assembled using readily available items. The backpack holds batteries and camping items. The solar cell on the cover trickle-charges batteries. The Isotron® antenna on an extendable pole clamps onto the backpack. In front of the backpack is (left to right) a gel cell battery, 35 mm camera strap, rig platform, rig, paddle, keyer, and charging cable. (Photo by KK5PY)

November and December 1998. Back issues are still available from *CQ*. Call *CQ* and get a copy while they last. Now let's quickly discuss antennas.

As previously discussed, M² Antenna's "HO" loops are mainly used for SSB/CW operations. When mounted on a light aluminum mast 5 or 6 feet tall, their low angle of radiation is dandy for terrestrial DXing (fig. 2[A]). Ah, but stack-mounting a 70 cm HO 6 inches above a trunk lid or roof, and a 2 meter HO 18 inches above that lid or roof, produces a more baseball-shaped radiation pattern that is ideal for OSCARing (fig. 2[B] and photo 3). The pattern is also omni-directional, eliminating antenna rotating requirements. Neat, clean, and most effective! These M² HO loops are dandy for numerous applications!

Ultralight Mobiling

Say you live in an antenna-restricted area and brief mobile ventures seem like the only way to enjoy big-time hamming? Do you occasionally wish HF operations could be more flexible and impromptu-portable oriented?

Well, as QRP aficionado and NeKe paddle producer Dennis Foster, KK5PY, shows us in photos 4 and 5, where there's a will, there's a way. After acquiring "what works and what flops" experience mobiling from a car, motorhome, and bicycle, Dennis concocted this Borg-type setup which supports happy hamming regardless of CC and Rs.

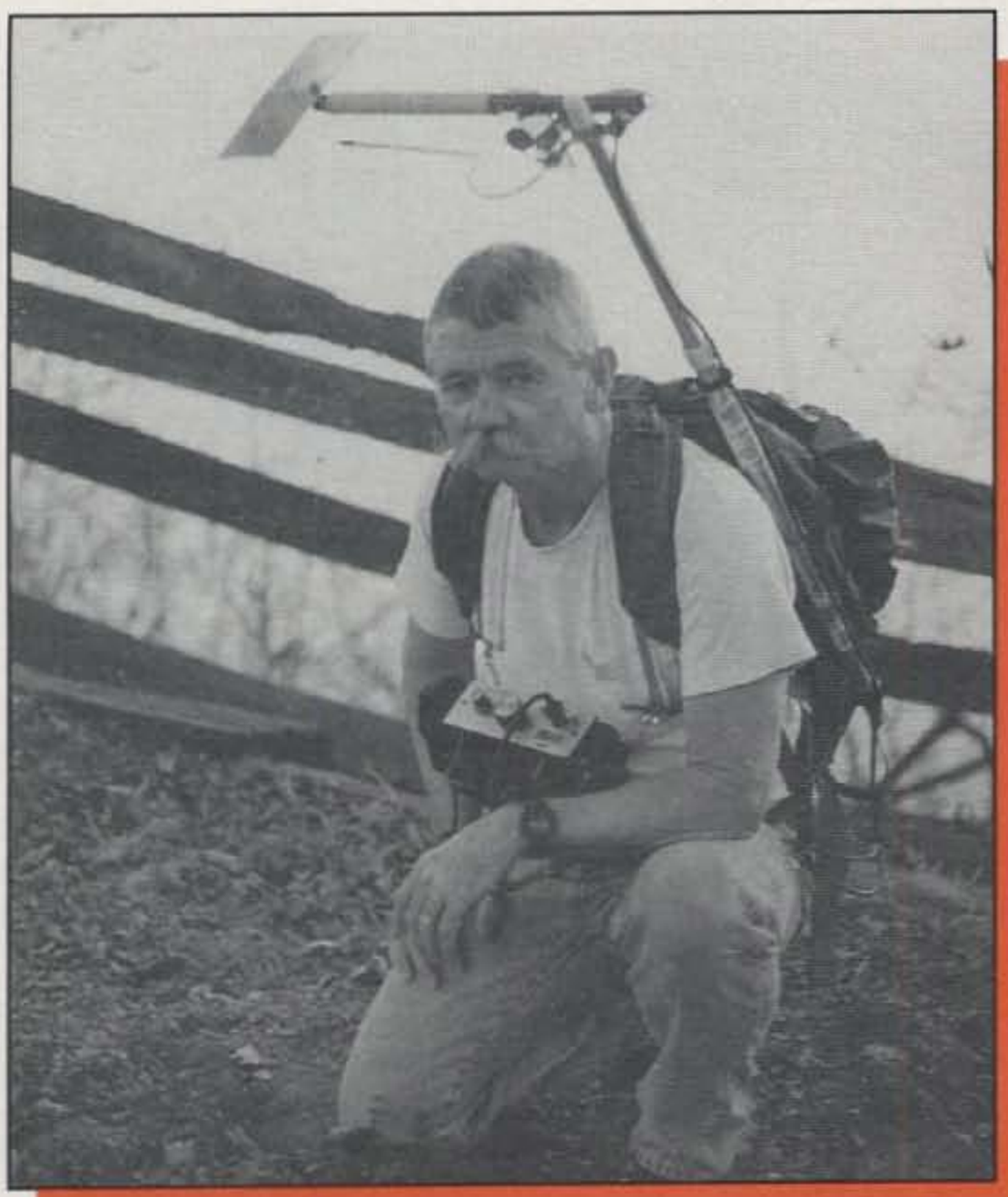
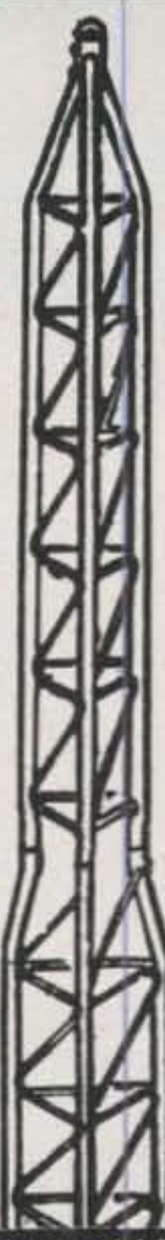


Photo 5– Here Dennis stoops down to show us his "walking mobile" setup in operation. Look carefully and you can see the mounting clamps for the Isotron®'s support pole on the backpack. Also visible is a small toroid coil at the Isotron® to minimize feedline radiation.

Dennis homebrewed his "walking mobile" setup from a variety of readily available items. First, a multipocket-type backpack was adopted for carrying a 7 amp gel cell battery, a small cell phone battery, a voltage monitor, and a toss-up wire antenna for overnight camping. A short paint-roller handle (a 3 foot "Mr. Longarm" sold at hardware stores) fitted with a small Isotron® antenna for 20 meters was then attached upright to the back-

Photo 6– The new Worldpack rig carrying case from Cutting Edge Enterprises is ideal for taking an ultra-compact HF transceiver and medium-size battery pack on any outing. The rig can be operated in or out of the case as discussed in the text.

ATTENTION !!!



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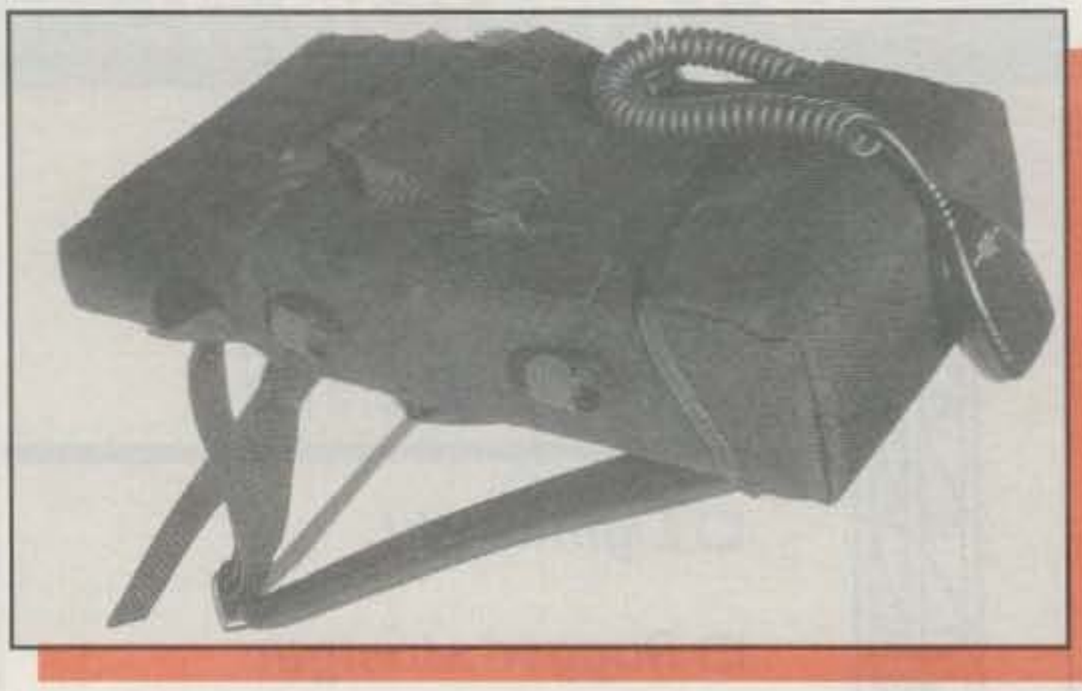

Photo 7– The Worldpack shown here closed up and ready for traveling. The setup is small enough to fit in the airline carry-on luggage category.

Photo 8– My Worldpack with an older Kantronics 30 meter transceiver and rebuilt to 4 foot tall Hamstick antenna ready for use. The laced section atop the case secures minilog and roll-up antenna. (Discussion in text.)

pack with clamps. This Isotron® antenna, incidentally, is the same one Dennis field-proved DX-worthy on his bicycle. (Both were featured in last year's mobile column. Maybe we all should take a closer look at this gem. It obviously "gets out" great.)

Next, a chest mount for the MFJ 20 meter SSB/CW transceiver was fabricated from a 35 mm camera carrying strap clamped to a black foam-padded and Velcro®-covered aluminum rig-mounting platform. Mating Velcro® strips on the transceiver hold it firmly to one side of the platform, while padding on the other side cushions the rig from chest thumps (and vice-versa!). Another piece of aluminum is also painted black and bent to serve as a sound deflector. It is Velcroed to the rig's top so the speaker "blows" up toward ear level. A small NeKe paddle and keyer plus trail snacks store in the backpack and "round out" the setup.

Dennis says the setup works surprisingly well—probably equal to many "average" mobile setups—and gives a refreshing sense of (ham) freedom. In his words, "anyone can enjoy getting on the air regardless of where they live with a setup like this." What else can I say except life in amateur radio is good, and unique pursuits give it that special touch!

New Worldpack HF Rig Case

The more you think about operating personal portable style, the more appealing it becomes. Yes, and Cutting Edge Enterprises has the perfect answer for making that idea reality with their new Worldpack carrying case for an ultra-compact rig such as the IC-706, TS-50, or FT-100 (photos 6, 7, and 8).

This heavy-duty 17" × 8" × 3" case is made of black nylon with thick foam padding and is weather resistant. The Worldpack has shoulder straps so it can be worn "backpack style," side straps for securing or supporting a mobile antenna such as the Outbacker, and a top strap so it can be carried upright, if desired. It also has a zip-open bottom compartment that holds an optional 7 amp rechargeable battery, a Velcro®-secured internal flap with feed-through holes for DC power and antenna, plus room for a microphone or key in the top cover. This gives the flexibility of being able to briefly operate the rig at low power in the case while walking (when cooling air is restricted), or the front and rear sections can be zipped open and folded down and the antenna fix-mounted for portable work.

Considered from the Y2K preparedness standpoint, this "ham in a bag" or "have rig, will travel" concept holds creditable merit. It brings together a complete station you can store in minimum space, and just pick up, carry anywhere, and operate on the spot. That opens endless possibilities—on a camel in the desert, in a rowboat, while soaking up sun at the beach, or just sitting in your bomb shelter watching to see what happens on 9-9-99. Worldpack cases plus battery packs, chargers, roll-up solar cells for long-run power independence, and more are available from Cutting Edge Enterprises, 1803 Mission St. #546, Santa Cruz, CA 95060 (telephone order line 1-800-206-0115). They are neat.

We are totally out of space for another month. Stay tuned for more captivating topics in coming months, enjoy a few on-the-air QSOs every day, and listen for me "manpack portable" on 30 meters CW!

73, Dave, K4TWJ

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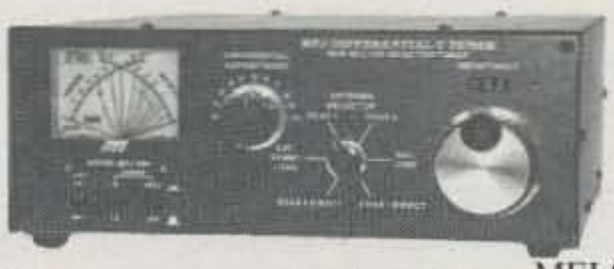

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Contest Calendar

BY JOHN DORR, K1AR

News/Views Of On-The-Air Competition

It's That Time of Year Again—Preparing for the Chase!

September's Contest Tip

RF interference is most often thought of in terms of your neighbor's television. However, it can be a menace in your shack, too. With the complexity of contest stations ever increasing, it's not enough anymore to run a few quick tests to see if RF is getting into the wrong places. Take the time, before this contest season, to test all antennas and bands, taking particular note of antenna direction (i.e., beam at your own house) to make sure the first time you discover a bad internal RF problem isn't during your first CQ in this year's CQ WW SSB Contest! And, remember you can never have enough ferrite on hand—all shapes, all sizes.

So here we are again, it's near the end of the summer. You've had the best of intentions to work on your antennas and station layout, but the temptation of summer fun got the best of you. Well, welcome to the club; you're probably not unlike most contesters I know. It's a reality that most of us are procrastinators by nature, and, while we may have great plans on paper, it's next to impossible to put those ideas into practice.

Hopefully most of you get the opportunity to scan my monthly contest tips. If you do, you'll learn that much of contesting has to do with preparation. And, while it may be getting late into the "prep" season to do meaningful antenna work, there's still much you can do to improve your scores this fall—and a shovel/climbing belt is not required!

For most of us, preparation starts by having a goal. It may not be an especially elaborate one, but a goal is a good thing nevertheless. For example, your goal may be "I just want to be active this contest season and work a bunch of new countries and have fun." Others may say, "I want to set personal scoring records in comparison to previous years." Still others may say, "I want to win the world, and, when finished on Sunday evening, assemble a plan for the United Nations that solves world hunger" (which of course contains the hidden agenda of ensuring 4U1UN makes it into your log next time).

2 Mitchell Pond Road, Windham, NH 03087
e-mail: <K1AR@contesting.com>

CALENDAR OF EVENTS

Aug. 28-29	SCC RTTY Championship
Aug. 28-29	Hawaii QSO Party
Sept. 4-5	All Asian SSB Contest
Sept. 5	North American CW Sprint
Sept. 5	Panama Anniversary SSB Contest
Sept. 11-12	Worked All Europe SSB Contest
Sept. 11-13	ARRL Sept. VHF QSO Party
Sept. 12	North American SSB Sprint
Sept. 18-19	Washington Salmon Run
Sept. 18-19	Scandinavian Activity CW Contest
Sept. 18-19	Air Force Anniversary QSO Party
Sept. 18-19	QCWA QSO Party
Sept. 19-20	Tennessee QSO Party
Sept 25-26	**CQ WW RTTY DX Contest**
Sept. 25-26	Scandinavian Activity SSB Contest
Oct. 2-3	VK/ZL SSB Contest
Oct. 2-3	California QSO Party
Oct. 2-3	F9AA Cup Contest
Oct. 3	RSGB 21/28 MHz SSB Contest
Oct. 7-9	YLRL Anniversary CW Party
Oct. 9-10	VK/ZL CW Contest
Oct. 9-10	Pennsylvania QSO Party
Oct. 16-17	JARTS WW RTTY Contest
Oct. 16-17	Worked All Germany Contest
Oct. 17	RSGB 21/28 MHz Contest
Oct. 17-18	Illinois QSO Party
Oct. 21-23	YLRL Anniversary SSB Party
Oct. 30-31	**CQ WW SSB DX Contest**
Nov. 27-28	**CQ WW CW DX Contest**

Beyond goal setting, there's a number of other things you can do to be ready for the chase. Let's outline them so that you, too, can be better prepared for this upcoming contest season.

Fixing the Easy Stuff

Now's the time to get to that intermittent connection in your shack. You know the one: it requires your microphone cable to be dressed in a certain way. Or, perhaps your coax switch needs to be rocked back and forth one too many times? What about that rotator indicator that's 30 degrees off? Do you really want to be computing antenna direction with a calculator during a 48-hour DX contest? Another common problem is those annoying burned-out bulbs in your equipment. You won't double a contest score with this stuff, but creature comfort is a meaningful contributor to the sport; don't underestimate it!

Those Nasty Computers

How many times have you spent the Friday before a contest in panic while you mess around with your computer(s)? Take a look at the September and October contest calendars. You'll notice that there's a bunch of events that will allow you to ring out your station—especially the computer component. Take the time now to make sure your voice board is working. If you're assisted, make sure that your packet network connection is set-up correctly. And you'll be a happy camper indeed if all the settings for radio control, CW keying, rotator control, etc. are ready to go.

Food and Creature Comforts

Hams must eat during contests. In fact, there's a rumor we have quite a passion for eating based on what I see around the hamfest circuit. So, with that in mind, a little food and drink preparation is a good thing. We're not talking about fine dining here, but rather microwave ovens and crockpots. Whatever your preference, getting your food and drink mandate in order is a freebie for contest score progress. Naturally, think about things that add energy. If you're eating items that make you want to lay down and take a nap it's off the list. Common sense prevails here more than anything.

There are other areas to consider, too. Have you found and setup that alarm clock so that you're not trying to track it down during the contest? Of course, there's always the need for two clocks with alarm settings separated by 10 minutes so you're sure you don't oversleep. How's that operating chair of yours doing? Is it set up for long-term usage and comfort, or have you been meaning to get to its settings for months and just haven't been able to? Or maybe you're using some old wooden thing that you wouldn't give to a prison. Spend some money here—a chair is as important as the radio itself.

Are you still using those headphones that Marconi gave to you for Christmas back in '07? Come on, spend a few bucks and get something nice. I promise that a combination of a nice chair, good food/drink, proper sleep preparation, and headphones will increase your contest scores.

The Week Before

Well, the contest is coming next weekend and you've decided to stay up and watch Jay Leno in his entirety for the week, getting up a few hours later at 6 a.m. for your morning run (I realize the latter is probably not in the cards for many of us, hi!). Now think about that one. Forcing yourself to get extra sleep the week before a

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In a similar way, it's not a bad plan to actually turn on a radio the week before a contest and check out the bands. Learn what times the bands are opening and closing. Find out what DXpeditions are active and work them. Read the traffic on the Internet to get a clue. You're about to run a marathon, the and marathon winners are always prepared; contesters should be, too!

The Most Important Element...

The operative thought this month is common sense. You may not have the resources or motivation to put up a three-element 40-meter Yagi, but I guarantee you know how to turn on a soldering iron. And, with a little planning by yourself or together with friends/club members, you can make this fall's contest experience the best you've ever had. With band conditions approaching peak performance, now's the time to enjoy our hobby overall, and the sport of contesting in particular. Don't let the lack of the simple side of preparation make you say, "if I had only..."

Final Comments

That's it for this month and I'm out of both space and time. I know I promised the CQ Contest Survey results this month, but work commitments got the best of me. Look for the summary next month.

Finally, one last thing for your reading pleasure. You'll be seeing the long-awaited results of the 1998 CQ WW SSB contest in this issue (CW next month).

The amount of work it takes to put these words to paper is staggering and it happens entirely due to the effort of a small group of volunteers and dedicated CQ personnel. If you have the occasion to run into any CQ Contest Committee members (in person, on the air, via e-mail, etc.), let them know how much you appreciate their efforts. I, for one, pass along my kudos for a job well done!

As always, please remember to send your contest calendar submissions to me for the December issue no later than October 1st.

73, John, K1AR
e-mail: K1AR@contesting.com

Panama Anniversary Contest
0001Z to 2359Z Sunday, Sept. 5

The Panama Radio Club invites all radio amateurs of the world to participate in the XXVIII Anniversary Contest.

Classes: Single Operator, All Band, SSB-only, 40, 20, and 15 meters.

Exchange: RS and serial number (e.g., 59001).

Scoring: HP club members count 2 points; all other stations count 1 point. The multiplier is the total number of DXCC countries worked on all bands. Final score is total QSO points times multiplier.

Awards: Certificate of participation will be sent to all amateurs who work 5 or more HP stations. HP stations must operate for at least 6 hours to be eligible for awards. A plaque will be awarded to the station with the high score from each continent.

Logs must be postmarked by December 1st and sent to: Radio Club Panama, Anniversary Contest, P.O. Box 10745, Panama 4, Panama.

ARRL September VHF QSO Party
1800Z Sat., to 0300Z Mon., Sept. 11–13

All bands, 50 MHz and up, can be used for this one. Details can be found on the ARRL Web site at <www.arrl.org>. It is recommended that you send for official summary and log sheets. A large SASE will get you a supply. Address your request to the ARRL VHF Party, 225 Main St., Newington, CT 06111.

Scandinavian Activity Contest
CW: Sept. 18–19 Phone: Sept. 25–26
1500Z Saturday to 1800Z Sunday

It's the world working in this 41st Scandinavian Activity Contest (SAC). The same station may be worked on each band for QSO and multiplier credit. The prefixes used in Scandinavia are: LA, LB, LG, LJ (Norway); JW (Svalbard & Bear Is); JX (Jan Mayen); OF, OG, OH, OI (Finland), OF0, OG0, OH0 (Aland Is.); OJ0 (Market Reef); OX (Greenland); OY (Faroe Is.); OZ (Denmark); SJ, SK, SL, SM, 7S, 8S (Sweden); and TF (Iceland).

Classes: Single operator and multi-operator single transmitter, all band only. Multi-operator must remain on the same band for at least 10 minutes (exception: A station may be worked on another band if it is a new multiplier, only). Also, QRP single operator (maximum of 10 watts output) and SWL (only SAC stations may be logged).

Bands: 3.5, 7, 14, 21, 28 MHz according to IARU band plans; 3560–3600, 3650–3700, 14060–14125, and 14300–14350 kHz should be kept free of contest activity.

Exchange: RS(T) plus a QSO number starting with 001.

Scoring: European stations score one point for each SAC contact. Non-Europeans score one point on 14, 21, and 28 MHz, and three points on 3.5 and 7 MHz.

Multiplier: Each call area in the above list of SAC countries worked on each band (call areas, not prefixes).

Final Score: The sum of QSO points from all bands times the sum of the multipliers worked on each band. Scoring for SWLs same as above.

Awards: Certificates to the winning station in each class, both CW and phone, in each country and each U.S.A. call area.

QRP stations will be listed in one common list. The non-SAC SWL winner will be awarded. Plaques will be awarded to the top-scoring station in each continent. Depending on the number of participants, the contest committee may consider additional awards.

The usual disqualification criteria will be observed. Include a summary sheet and a dupe sheet for logs with more than 200 QSOs, plus a signed declaration. Logs may also be submitted on MS-DOS diskettes in either ASCII format or the accepted ARRL contest log standard. If you send your log on disk, paper logs are not required. The summary sheet must always be on paper. All disks must be clearly labeled with call, contest name, class, and date of the contest. CW and SSB portions may be on the same disk. An SASE is needed if you want your disk returned.

Mailing deadline for all logs is no later than October 31st. Send all entries to: SAC Contest Manager, OH3WW, Hannu Saila, Muurainkorventie 17, FIN-33470 Ylojarvi, Finland. E-mail logs go to: <sac @contesting.com>.

Air Force Anniversary QSO Party
0001Z Sat., Sept. 18 to 2359Z Sun., Sept. 19

The purpose of this annual event is to create an on-the-air gathering of as many active and former members of the Air Force as possible for a weekend of fellowship and in remembrance of all those who served. Operation is permitted on all bands and modes.

Scoring: Contacts are scored by "point identifier." Stations with licensees and no Air Force affiliation have a point identifier of 1, are worth one point, and would identify with the suffix "Air Force One" on phone or "/AF1" on CW or digital modes. If the licensee is a U.S. Air Force veteran, member, or retiree (of any component, active, Air National Guard, or AF Reserve), the point identifier is determined by subtracting the year licensee entered the Air Force from 1998. For example, if he or she entered the Air Force in 1947, the point identifier is 50 (1998 – 1948 = 50), and he or she would ID "AF/50." Obviously, the most sought after stations will be those brave men and women who entered the Air Force in 1947, whose point identifiers will be "50" and whose contacts are worth 50 points! Add total point identifiers for all qualifying contacts.

This year a multiplier is being added. Multipliers are determined by counting the number of different point identifiers worked and multiplying your score by that multiplier. For example, if you work four stations with point identifiers of "AF8," "AF22," "AF8," and "AF4," you would determine your final score by first adding together all of the point identifiers (8 + 22 + 8 + 4B) and then multiplying that number by three (since you worked three different point identifiers: AF8, AF22, and AF4), for a final total of 126 (42 × 3 = 126). (Note that you can count each identifier only once for the multiplier. Therefore, in this example you can count "AF8" only once as a multiplier, even though you worked two "AF8" stations.)

Stations may be worked multiple times on the same band if the contacts are on different modes, but only once on each band if on the same mode. Stations may be worked and scored on multiple bands. A score calculation worksheet is available for download on the Razorback Radio Club web site found at: <http://ourworld.compuserve.com/homepages/k5xs>.

Bonus Stations: New point bonuses are available for working stations operating from the premises of Air Force installations worldwide. All stations (club or individual) operating within the boundaries of an Air Force base will identify the name of the base they are on—i.e., K5TYP (the Mississippi winner for 1997) will identify "K5TYP, Air Force 51, Keesler Air Force Base." The Razorback Radio Club station located on Hickam Air Force Base will identify "K5HOG, Air Force 24, Hickam Air Force Base." For each of those stations you work (even if more than one are on the same base), you may count their usual point identifiers (and use them to compute the multiplier above) and also earn a bonus of 100 points per station to be added to your final score. If you work four stations located on AF bases, you may add 400 points to your score.

Awards: A trophy (plaque) with Air Force 50th Anniversary logo signed by the Headquarters, United States Air Force Director of Communications and Information (Lt. General William Donahue) will be awarded to the overall winner. Certificates (signed and with AF 50th logo) will be sent to the top three finishers in each state and country.

Logs are to be postmarked by October 15, 1999 to: K5HOG – Razorback Radio Club, 604 Julian Avenue, Honolulu, HI 96818. Logs must have station worked, date, time, mode, band, and point identifiers for each contact. **Points must be totalled on each page to be accepted.** Neither accepted nor rejected log sheets will be returned unless accompanied by a suitable SASE. Direct all questions to: Bernie Skoch, K5XS, Colonel, US Air Force Director of Communications and Information, Headquarters Pacific Air Forces, 604 Julian Avenue, Hickam Air Force Base, Honolulu, HI 96818. Electronic logs may be submitted (ASCII-only) to: <k5hog@aol.com>.

Washington State Salmon Run
1600Z Sat., to 0700Z Sun., Sept. 18–19
1600Z to 2400Z Sun., Sept. 19

This popular state QSO party is sponsored by the Western Washington DX

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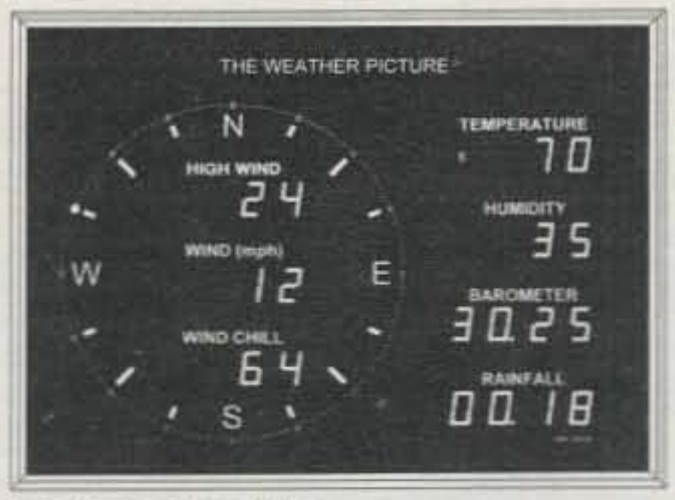

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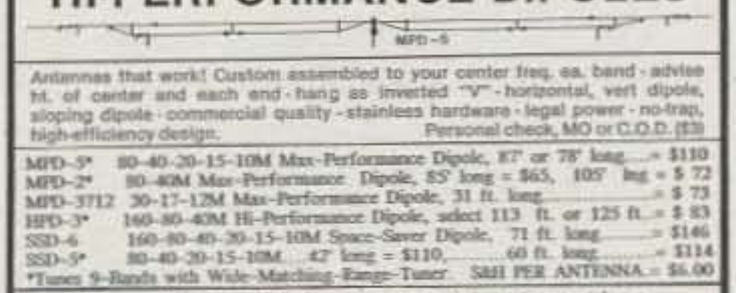

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MPD-3712	30-17-12M Max-Performance Dipole, 31 ft. long	= $ 73
HPD-3*	160-80-40M Hi-Performance Dipole, adjust 113 ft. or 125 ft.	= $ 83
SSD-6	160-80-40-20-15-10M Space-Saver Dipole, 71 ft. long	= $146
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Club and is open to amateurs worldwide on SSB and CW.

Classes: Single or Multi-Operator, Single Transmitter. Also, entrants may operate QRP, low power (200 watts or less), or in the open category on SSB, CW, or mixed modes. There will be a special competition among Washington State Clubs in the Multi-Single category.

Exchange: RS(T) and QTH (state/province/DXCC country or Washington state county).

Scoring: Count 2 points for SSB and 3 points for CW. QSOs with CW Novice/Technicians are worth 6 points. The multipliers are Washington counties (maximum 39) or state/provinces/DXCC countries for Washington state stations. Credit multipliers only once per mode on multiple bands. Final score is total QSO points times multiplier. Low-power stations multiply score by 2 and QRP by 3.

Frequencies: CW—1815, 3550, 7045, 14050, 21050, and 28050. SSB—1845, 3925, 7260, 14280, 21380, and 28380. Novices—3700, 7125, 21150, and 28160.

Awards: The highest scores in each DX country and US call area will receive a package of Pacific Northwest smoked salmon. Certificates will be available for other category winners. A participation certificate will be awarded to each log submitted (50 QSOs [US], 25 QSOs [DX], 100 QSOs [Washington state] minimum). A special award will be awarded to the highest Washington club score.

The mailing deadline for logs is October 31st. Logs can be sent to: W7DX Western Washington DX Club, P.O. Box 395, Mercer Island, WA 98040.

Tennessee QSO Party

1800Z Sun., to 0100Z Mon., Sept. 19–20

This is a rejuvenated event sponsored by the Tennessee Contest Group. You are encouraged to give it a try. Tennessee stations may work anyone; those outside Tennessee work only Tennessee stations. Stations may be worked once per band/mode. Mobiles may be worked again if they change counties. No repeater contacts (or contacts on repeater frequencies) are allowed. Data-mode QSOs must have a licensed operator present at both stations (i.e., no "robots").

Exchange: RS(T) and Tennessee county/state/province/DXCC country.

Scoring: One point per QSO on HF phone; two on HF CW or digital modes. Two points on VHF/UHF phone and digital; four on VHF/UHF CW. Multipliers are Tennessee counties (95 maximum). Stations in Tennessee may also add U.S. states, Canadian provinces/territories, and DXCC countries. Don't forget to count USA, Canada, Alaska, and Hawaii as countries, and Tennessee, Alaska, and Hawaii as states.

Bonus points: All entrants may claim 100 bonus points for each QSO with TCG headquarters station K4TCG. Tennessee mobile operators may claim 500 bonus points for each Tennessee county from which they complete at least 10 QSOs. All bonus points are added after the geographic multiplier.

Frequencies: CW—1815, 3540, 7040, 14040, 21040, 28040. SSB—1855, 3900, 7240, 14280, 21390, 28390. Novice/Tech—3700, 7130, 21140, 28140, 28390. RTTY—3620, 7080, 14080. VHF/UHF—50.195, 144.195, 146.55, 223.50, 446.0.

Awards: Certificates will be awarded to the five highest scoring Tennessee stations in each category. Certificates will also be awarded to the highest scoring station in each U.S. state, Canadian call area, and DXCC country. And, a certificate will be awarded to the first-place team entry (certificate will be sent to the leading entrant on the team). TCG Headquar-

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Our latest product is the **CIA-HF Complex Impedance Analyzer** which displays four different curves representing **SWR, Resistance, Impedance and Reactance relative to frequency** over an operating range of **400 kHz to 54 MHz**. In addition, many other parameters can be displayed in digital format such as the **2:1 SWR limits** of a circuit or antenna under test, the **relative Q**, **Phase angle**, **Return Loss,** Inductance, Capacitance, Inductance or Capacitance to provide a **conjugate match**, **minimum SWR frequency and magnitude** within sweep range, normalized 50 ohm impedance and more. You can even use the CIA-HF to determine the **distance to the first short or open** in a coaxial cable, a useful feature for determining the length of a cable on a reel or in the ground. The CIA-HF also has a built-in serial port for interfacing with a PC. Future applications software will enable you to print out curves that will **knock your socks off**! The introductory price is only $399.95 plus Shipping and Handling (S&H).

Our SWR - 121 V/U gives you the ability to see a graphical display of SWR for antennas in the VHF and UHF ranges. This product gives you **Return Loss** and a **serial port** for computer operation or storage of curves. The SWR - 121 V/U covers a frequency range of 120-175, 200-225 and 400-475 MHz. The SWR - 121 V/U is priced at only $399.95 plus S&H.

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ters Station K4TCG and the TCG itself are not eligible for awards.

Teams: There have been some changes to team competition in 1999. A team consists of between two and five stations, with any number of operators. Teams do not need to be registered in advance, and team members do not need to be members of any radio club. Team members must indicate the name of their team on their entry. There is separate competition for teams whose members are in Tennessee, and for teams whose members are outside the state. Multi-operator stations may participate in team competition. If more than five stations in a club would like to participate in team competition, they may form more than one team. ("Podunk Radio Club—Team #1," "Podunk Radio Club—Team #2," etc.)

Computer logs are encouraged, on MS-DOS formatted floppy disks or via mail. Logs must be in ASCII text format. Be sure your callsign and mailing address are on your entry. Template files for the TRLog and NA contest programs are posted on the TCG Home Page at <http://www.k4ro.net/tcg/tqp.htm>. If you don't have Internet access, mail your log (or inquiries) to: Tennessee QSO Party, c/o Douglas Smith, W9WI, 1385 Old Clarksville Pike, Pleasant View, TN 37146-8098. Logs must be postmarked before November 12. Enclose a business-size SASE for results, or watch the TCG Home Page at the address above.

CQ/RJ WW RTTY DX Contest
0000Z Sat. to 2400Z Sun., Sept. 25–26

This is the annual running of the CQ/RJ WW RTTY DX Contest organized by *CQ* magazineand the *RTTY Journal.*

Bands: All five bands, 10–80 meters.

Classes: Single Operator, Single and All Band, and Single-Op Assisted All Band only. Multi-Operator, Single Transmitter, All Band only. There is also a High and Low Power category. Keep in mind that competitors in all categories may operate the entire 48-hour contest period.

Exchange: RST, state or VE area, and *CQ* zone for stations within the 48 continental U.S. states and 13 Canadian areas. All others send RST and *CQ* zone.

Points: One for contacts within own country. Two for contacts outside own country but same continent. Three for contacts outside own continent.

Multiplier: One for each state (48) and VE area (13). One for each DX country (ARRL and WAE list). One for each *CQ* zone (40). All of the above on each band.

Final Score: Total QSO points from all bands times the sum of the multiplier from each band.

Awards: Plaques to the first-place winners in each operator classes. Certificates to the second and third place winners. Certificates to the first-place finisher in each DX country.

Complete, detailed rules were published in the July issue of *CQ* and should be reviewed for more detailed information. The standard *CQ* log and summary sheets are available from *CQ*. Include an SASE (or IRC) with your request. Logs may also be submitted electronically (see rules). All entries must be postmarked no later than December 1st. An extension may be given upon a written request. Low Power logs go to: CQ RTTY Contest, Roy Gould, K1RY, P.O. Box DX, Stow, MA 01775-0312; e-mail: <K1RY@contesting.com>. All High Power logs should be sent to: Ron Stailey, K5DJ, 504 Dove Haven Drive, Round Rock, TX 78664-5926; e-mail: <K5DJ@contesting.com>. Requests for log forms only go directly to *CQ*.

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CIRCLE 73 ON READER SERVICE CARD

Awards

BY TED MELINOSKY, K1BV

News Of Certificate And Award Collecting

This month we present a profile of Fred Levinson, KF9YL, USA-CA All Counties #972, May 19, 1999. Fred only began county hunting five years ago, and here is his story.

"I got started in county hunting five years ago, when I moved into a house (Lake County, Illinois) from an apartment. My antennas were inside the attic (an Isoloop and 40/15 meter folded "Z"), and even though I wasn't the strongest signal, I was able to make a lot of DX and stateside contacts and have a lot of fun.

"As the QSL cards began to arrive, I realized that I had confirmed many counties. I decided to try to complete USA-CA with all contacts from home with the indoor antennas. I found the County Hunting Net and listened to learn the procedure and then got started The net sounded like fun, and there were many people helping each other obtain a common goal—people driving to counties, meeting, assisting. This was nice. When you have only 500+/– counties confirmed, every time you turn on the radio there are a lot of new counties to contact, so it is easy to get hooked. The USA-CA rules are flexible, so you can make the award very easy or very hard to complete (just try to complete USA-CA contacting only fixed stations).

"Recently, I decided to move to south Florida. I had 3000-plus counties confirmed from my house and realized that I wasn't going to complete USA-CA before moving. Because there would not be any difference between finishing up the last 75 counties from Florida or from the car, I started counting future contacts from the car. I posted my needs on the CH web pages (tnx K31MC and KK7X for your web pages), and when I got down to the final 25, I also used databases to search for hams livings in counties that I needed. I wanted to finish before moving. Indeed, the county hunters and other

65 Glebe Road, Spofford, NH 03462-4411
e-mail: k1bv@top.monad.net

USA-CA Special Honor Roll

Thomas M. Carr, KGØBB
USA-CA All Counties #974
June 4, 1999

USA-CA Honor Roll

500

OE5CA	3079
KGØBB	3080
GM3UTQ	3081
EK4JJ	3082

1000

OE5CA	1514
KGØBB	1515

1500

OE5CA	1262
KGØBB	1263

2000

OE5CA	1160
KGØBB	1161
AA1KS	1162

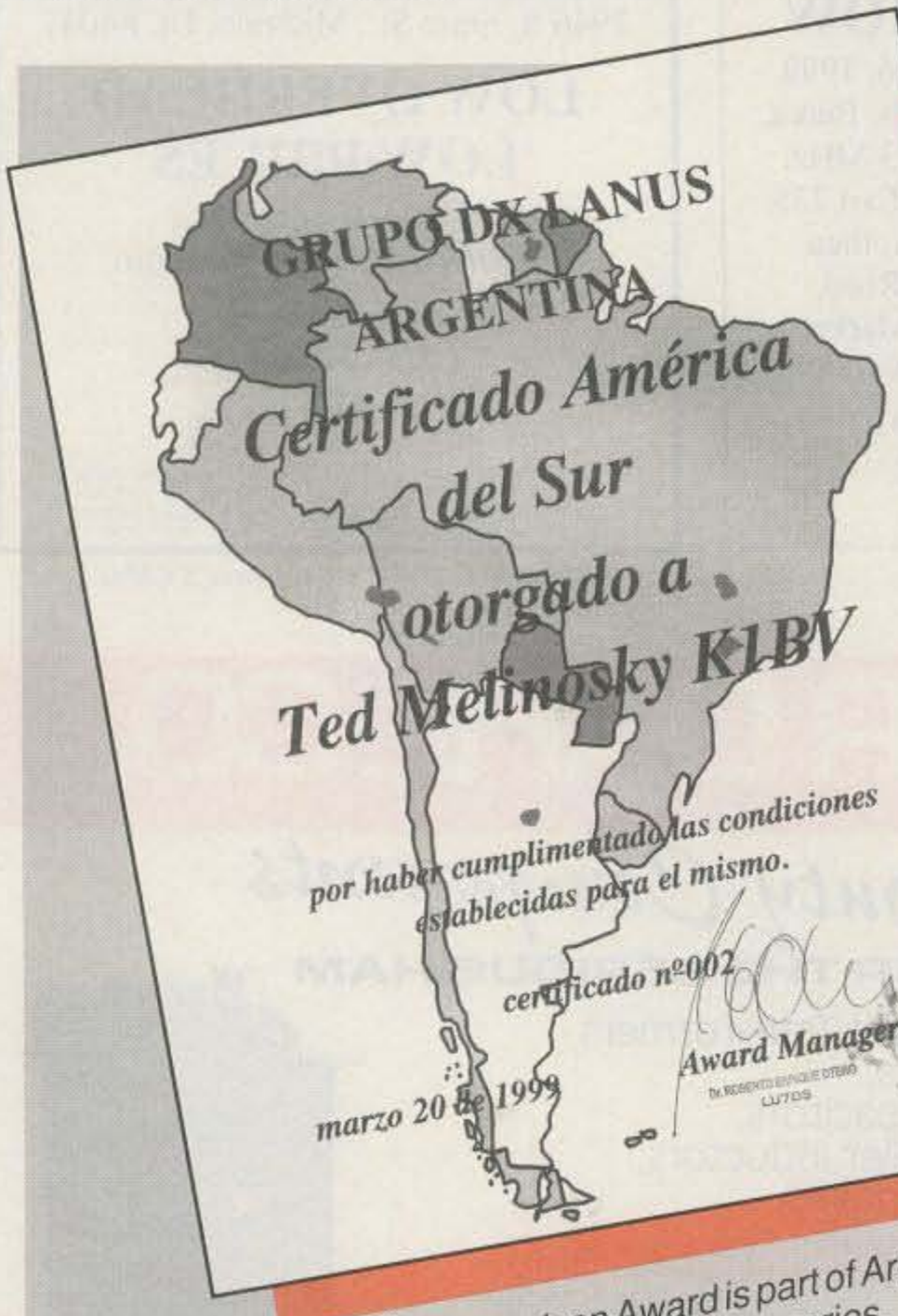
2500

OE5CA	1085
KGØBB	1086

3000

KGØBB	991

The total number of counties for credit for the United States of America Counties Award is 3076. The basic award fee for subscribers is $4.00. For nonsubscribers it is $10.00. To qualify for the special subscriber rate, please send a recent *CQ* mailing label with your application. Initial application may be submitted in the USA-CA Record Book, which may be obtained from *CQ* Magazine, 25 Newbridge Road, Hicksville, NY 11801 USA for $2.50, or by a PC-printed computer listing which is in alphabetical order by state and county within the state. To be eligible for the USA-CA Award, applicants must comply with the rules of the program as set forth in the revised USA-CA Rules and Program dated March 1, 1997. A complete copy of the rules may be obtained by sending an SASE to Ted Melinosky, K1BV, 65 Glebe Road, Spofford, NH 03462-4411 USA. DX stations must include extra postage for airmail reply.



The South American Award is part of Argentina's Lanus DX Group series.

The Flandre 59 Award is issued at various levels for contacting stations in the Flandre province of France.

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friendly hams helped me to complete my goal. On May 3rd (with one week to spare before the move), I worked AI5P in Lane, KS for #3076. Overall, approximately 3025 counties were contacted from my house.

"Shortly after getting hooked on county hunting, I decided to try mobile HF. I put the rig in the car to be able to help others with new counties. It was nothing fancy to start with—a simple power cable from the battery, the IC-706 from the shack, Hamstick antenna, a spiral notebook for logging contacts, and a good map. I began by operated from the neighboring counties and enjoyed it so much that I started driving just to operate from new counties. I've now operated from hundreds of counties. This led me to learn about the best reasons to county hunt and complete USA-CA.

"My favorite reason for county hunting is because it's a great way to see our beautiful nation and to learn USA geography. (Get your kids involved and teach them about different parts of our country.) When I was home, I had a map running on the computer and followed people across the country. When I operated mobile, instead of driving on the highways and seeing miles and miles of billboards, I took rural roads (occasionally unpaved and barely marked) through Smalltowns, USA. There is fantastic, diverse scenery: state/national forests, scenic vistas, bald eagles, deer and other animals, evening minor league baseball games, gravel road shortcuts in the middle of nowhere, frozen lakes, rain, blizzards, hot summer days, Main Streets, sunsets on unspoiled beaches, local festivals . . . If you haven't operated mobile HF, put your rig in the car, a magnet-mount or trunk-lip antenna on the car, and drive in any direction. It's simple and inexpensive.

"Another reason for county hunting is the thrill of being able to talk to VK, ZL, JA, Europe, Africa, and South America from your car. You quickly realize that for a few minutes you are on the other side of the pile-up because hams worldwide are calling you for your county! I have been a ham for many years and I am still amazed by the 'magic' of communicating with a DX station while driving in the car.

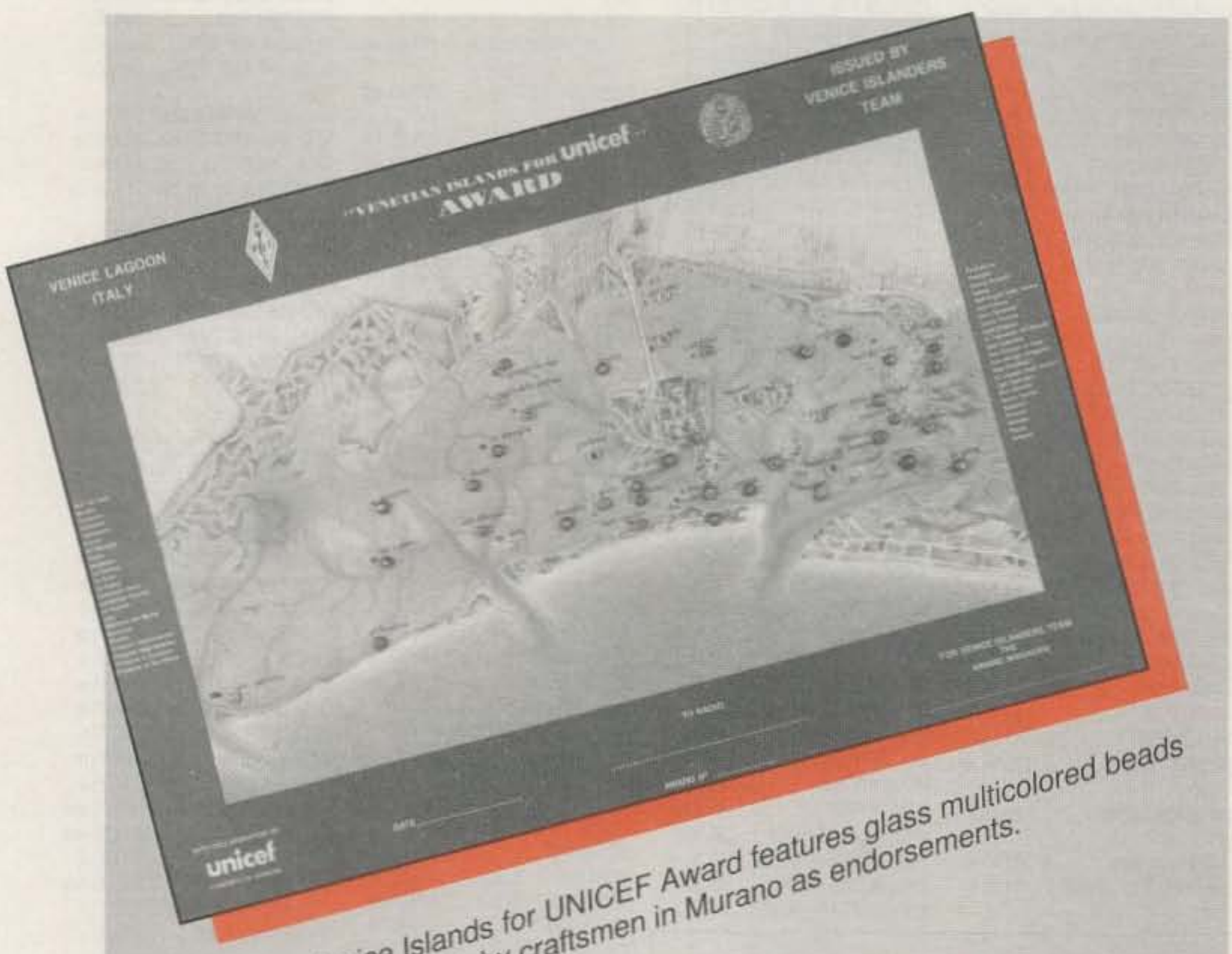
"Finally, it is the gratification of being able to help other county hunters complete USA-CA and occasionally meeting them on the road. Many times while running counties I have been in the area of a county hunter who invites me for a cup of coffee or an eyeball along the road.

"There are a lot of people to thank. Most important is my wife Elise (for putting up with me for the last five years of chasing USA-CA), AI5P for #3076, WBØLIW for #3075, and all of the mobiles I contacted to complete USA-CA. I also want to thank the net controls, assistants, W9MON (the "Elmer" of WB9LDH, where I got my Novice license in 1977—WD9JFB), the Prairie DX Group (N9PD), and the North Shore Radio Club (NS9RC) for all of their support. And finally, thanks to everyone else on the net who helps out and makes 'newbies' feel welcome in the group.—73s, Fred, KF9YL"

Award Sponsors and E-Mail

A message from Ric Coleman, ZL2RIC, suggests that it is about time for all award managers to have and publicize an e-mail address. Ric's efforts have been documented in the January edition of this column for the past two years due to his sponsorship of the ZL2000 award. In just a few months, New Zealand will be one of the first modern countries to "experience" the year 2000 for all the hope and excitement that event has generated. Full details of this Special Event award will be forthcoming, of course.

Ric notes that as an award sponsor, he gets many letters and inquiries (most without SASE/IRC) from people wanting to know the status of their award. Most of the questioners pay the fee for surface delivery, which means an awfully long boat ride from the South Pacific. Ric's point is that an e-mail return address added to the inquiring letter would result in a quick and inexpensive reply on his part. We'll do our part in this column by adding e-mail addresses to awards if they are supplied.



The Venice Islands for UNICEF Award features glass multicolored beads made by craftsmen in Murano as endorsements.

DX Awards

Argentina's Lanus DX Group Series. Dr. Roberto Otero is the awards manager for the Lanus DX Group, which offers a relatively easy to achieve awards series as follows.

General Requirements: All contacts must be on HF (no use of the WARC bands), and all contacts must have been made from the same country. Excess monies collected from the awards will be used to help finance the group's DX-pedition activity. Send GCR list and fee of $US8 or 10 IRCs for each to: Roberto Enrique Otero, LU7DS, Dr. Melo 2734, 1824 Lanus (Bs. As.), Argentina (e-mail: <reotero@ciudad.com.ar>).

South American Award—10 different South American countries.

One Hundred Countries—100 DXCC countries.

Six Continents—The 6 continents.

France's Flandre 59 Award. Almost every one of the French provinces offers an award for contacting stations which are located in the particular province. The French postal system makes it quite easy to determine the province identity, since it is shown as the first two digits of the five-digit postal code.

For the following award, stations in the Department of Nord will have a postal

code beginning with 59. It's quite easy to organize your French QSLs to determine if you qualify for these awards. My method is to make a simple list in a columnar format with the province number forming the left column and to populate the rows with the stations confirmed. A quick check of this (not up to date) record shows I have 14 confirmed from province 59. Evidently, province 59 is one of the well-populated provinces. It's time for me to apply for the real award instead of a sample!

General Requirements: Contact Flandre stations since 1 January 1950 using all bands and modes. The GCR list should also include the name of the city or town of the station. The award is issued in five different levels as follows:

Basic Award—5 different stations
One Star—10 different stations
Two Stars—15 different stations
Three Stars—20 different stations
Excellence—25 different stations

Send GCR list and fee of 10 IRCs to: Bernard Squedin, F5INJ, 52 rue de Peronne, F-59400 Cambrai, France (e-mail: <f5inj@nordnet.fr>).

Italy's Venice Islands for UNICEF Award. Check your logs for contacts made during the summer with portable stations operating from any of the little islands located in the lagoon protecting the city of Venice. The award shows the lagoon and each of the islands. The award has a charitable twist in requiring you to submit a receipt for your donation in any amount to UNICEF.

Contact or hear at least two stations operating from different islands in the lagoon of Venice. Unique endorsements are glass multicolored beads, made by local craftsmen in Murano, to attach to the award.

Basic award—2 to 10 islands, requires a log extract, proof of having made any amount of a contribution to UNICEF (letter, cancelled check, receipt), and fee of L20,000 or $US12.

Endorsements—require data as above, including UNICEF contribution and fee of L5,000 or $US4.

Contacts must be made with members of the Venice Islander Team starting from 1 January 1997. Use of repeaters is not allowed. Apply to Venice Islands for UNICEF, Award Manager IK3TTY, Sezione ARE Venezia, P.O. Box 181, I-30100 Venezia, Italy.

Eligible islands: Buel Del Lovo, Burano, Campalto, Campana, Carbonera, Crevan, Ex Batteria Poveglia, Fisolo, La Certosa, La Cura, La Giudecca, La Grazia, La Salina, Lazzaretto Nuovo, Lazzaretto Vecchio, Le Vigole Lido, Madonna Del Monte, Mazzorbo, Murano, Ottagono Alberoni, Ottagono Ca'roman, Ottagono S. Pietro, Ottagono Abbandonato, Pellestrina Poveglia, Tessers, Torcello, Trezze,

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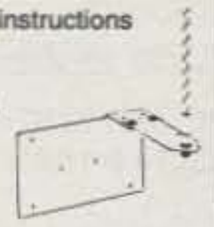
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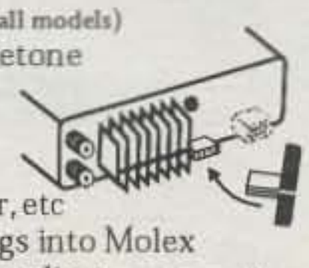
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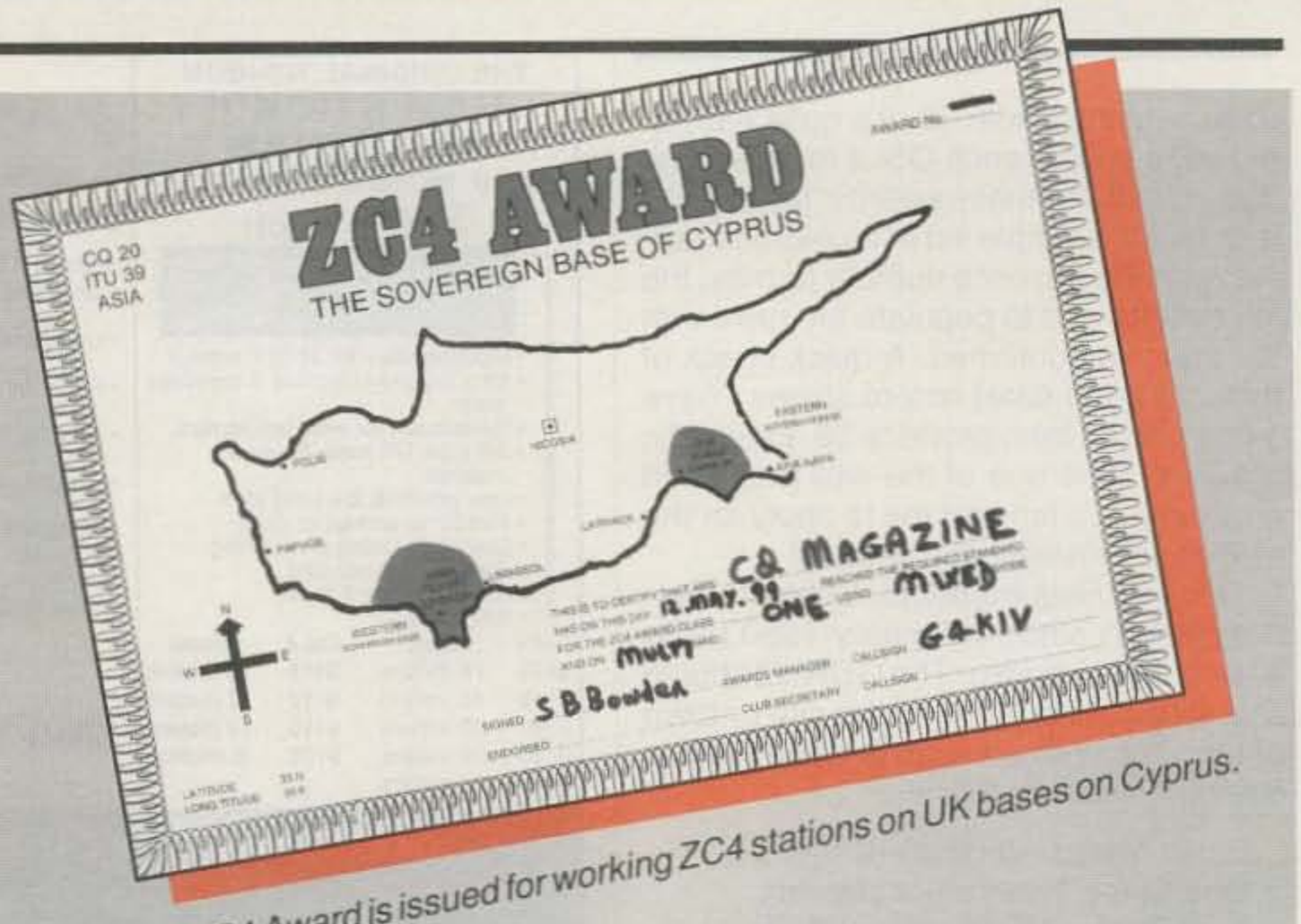
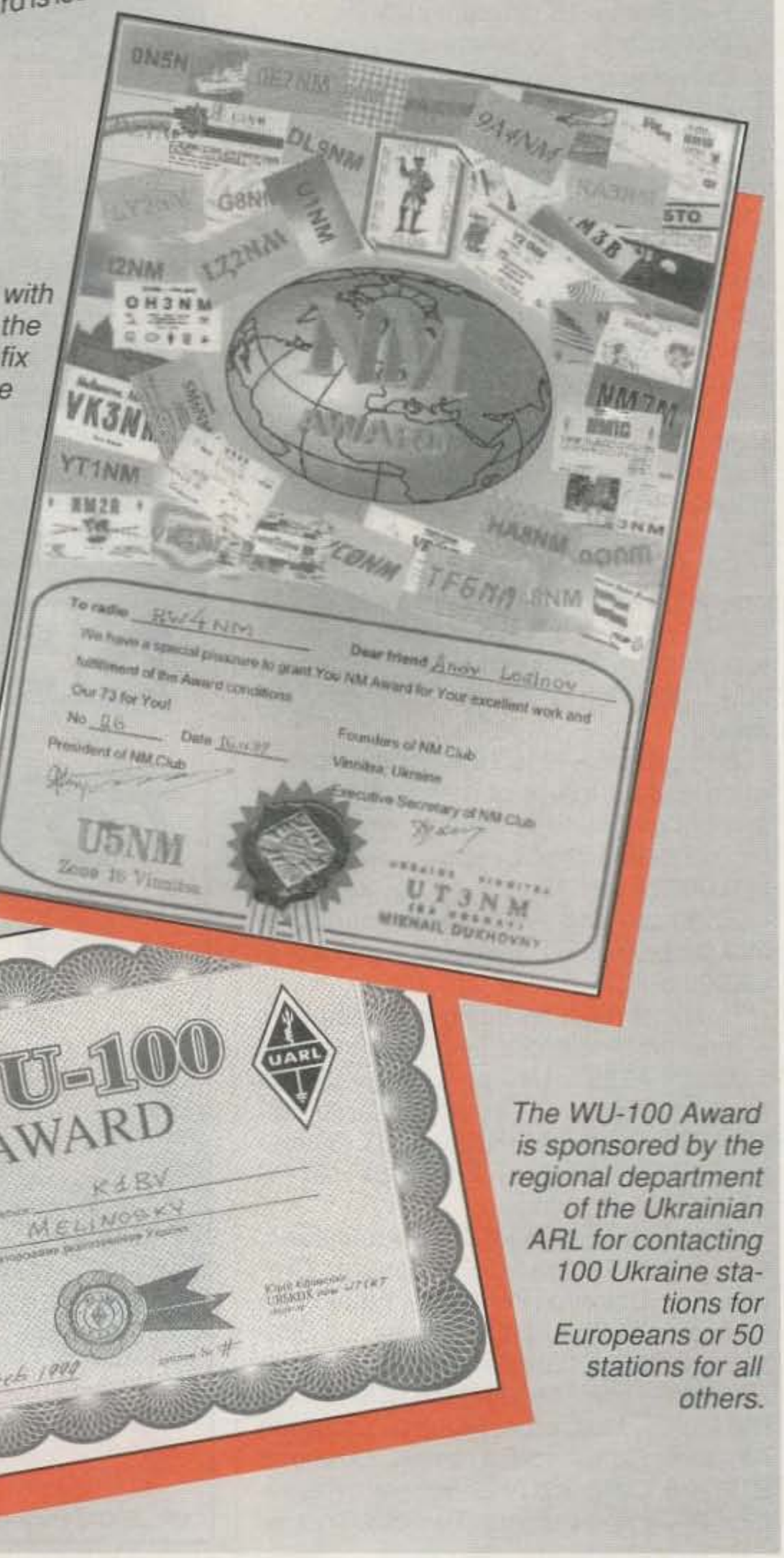


The ZC4 Award is issued for working ZC4 stations on UK bases on Cyprus.



The Ukraine's NM Award is given for contacting stations with the letters "NM" as the station suffix or prefix and members of the NM-club.

The WU-100 Award is sponsored by the regional department of the Ukrainian ARL for contacting 100 Ukraine stations for Europeans or 50 stations for all others.

Sacca Sessola, Spignon, S. Angelo, S. Ariano, S. Clemente, S. Cristina, S. Erasmo, S. Francesco, S. Giacomo, S. Giorgio In Alga, S. Giorgio Maggiore, S. Giuliano, S. Lazzaro, S. Secondo, S. Servolo, S. Spirito, Venezia.

Members: I3BQC, I3DSO, I3LLY, I3MDU, I3THJ, IK3ABY, IK3BPN, IK3BSM, IK3GHW, IK3HHW, IK3MQO, IK3PQH, IK3RIY, IK3TTY, IK3ZAW, IZ3ALE, IZ3ZVW.

Their www site is: <http://www-dx.deis.unibo.it/htdx/unicef.htm>.

UK Bases on Cyprus ZC4 Award. The ZC4 Award could be a bit tough, since UK Bases on Cyprus are #95 on the DXers' top 100 needed countries listing for 1998, and the entry level is to work three of them. However, a little challenge never stands in the way of the DX awards hunter. The award features an outline map of Cyprus with the principal UK bases outlined in red.

Work (or hear—SWL) ZC4 stations on UK bases on Cyprus. The award is available in three classes with band and/or mode endorsements as you may have earned. The same callsign may be worked on different bands.

Class 1—10 ZC4 callsigns
Class 2—5 ZC4 callsigns
Class 3—3 ZC4 callsigns

Send a GCR list and the award fee of $US6 or 10 IRCs to: Stephen Bowden, CAO, JSSU (AN), Ayios Nikolaos, BFPO59, London, UK.

Ukraine NM Award. Your callsign is a very special part of your amateur identity. It's always a thrill to work a station that shares your suffix, for example. UT3NM has collected "NM" suffixes over the years and offers a very handsome and colorful award displaying some of the dozens of DX cards showing those letters from his collection. The picture in the column is reproduced from a JPEG image downloaded from the Internet.

This award is available to amateurs who make contact with stations on three different continents or in five different countries on a single continent. The contacts must include the two letters "NM" as the station prefix or suffix (i.e., UT5NM, NM3B). Also, it is necessary to make at least three contacts with the founders of the NM club (UT3NM, UT5NM, UT7NM, UTØNM, U5NM). The QSLs for all needed QSOs must be enclosed with the application. All bands and modes may be used. No date limitations. The fee is 5 IRCs, and I'd suggest including extra for return postage. Apply to: Mike Dukhovny, 24/3 Pirogov St., Vinnitsa, Ukraine 286018.

Ukraine WU-100 Award. Another one from the Ukraine is the WU-100 award. It requires working specified numbers of Ukraine stations, something that could be fairly easy for many using DX contests as an awards-earning tool. There are some *loud* stations active in most contests from the Ukraine.

The award is sponsored by the Rivne regional department of the Ukrainian ARL. Europeans need 100 Ukraine stations; all others need 50. Contacts must have been made since 1 January 1996. All bands and modes may be used, and you may work the same station on different bands for credit. SWL okay. Send GCR list and fee of 8 IRCs, or $US5, or DM7, or 6000 lire to: Paul Tarasovich, UT1KY, P.O. Box 85, Rivne 266027, Ukraine.

URL of the Month

The French National organization (REF) maintains a site which provides rules and images of the 12 awards in their excellent program. The images are linked to the rules, and navigation is quite easy. This is in French. The URL is: <http://www.ref63.inetech.fr/diplomes/francais/Apercu/index.htm>.

You are encouraged to submit rules and samples of your club or organization's award program.

73, Ted, K1BV

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News Of Communication Around The World

Annobon

A couple of Spanish DXers will team up with two local operators to put **Annobon Island 3CØ** on the air this month. Vic, EA5YN, and Elmo, EA5BYP, will join Roberto, 3C1RV, and Ramon, 3C1GS, to operate as **3CØR** Sept. 14–24.

Annobon (formerly known as Pagalu island) is a separate DXCC entity from its parent "country" of Equatorial Guinea. The island is about 27 square miles in size and lies to the south of Sao Tome S9. To get there the Spanish DXpeditioners will fly to Lisbon and then on to Sao Tome. There they will meet up with the Equatorial Guinea operators to board the 42 ft. sailing vessel *Nere Balandra*. They considering flying to Annobon, but the air charter costs of more than US$15,000 were too high. Even so, the boat will cost over US$6000 to charter. Another major cost has been shipping. Because of very limited luggage to Sao Tome, the operators had to ship all gear, antennas, etc., to Africa ahead of the operation. This added US$2000 to the trip. The operators plan four stations, with one dedicated to RTTY. EA5BYP and 3C1GS will operate SSB while EA5YN handles CW and 3C1RV does the RTTY honors. QSL to Angel Garcia Mendoza, EA5FVY, Apartado 3045, 03080 Alicante, Spain.

The early sponsors are the Lynx DX Group and the Clipperton DX Club. Additional donations may be sent to co-organizer Tony Galiana, EA5BY, c/o Lynx DX Club, P.O. Box 430, E-03200 Elche, Spain.

Annobon ranks in the top 20 on many Most Wanted lists, and higher in Japan. The operators have significant experience in the region, having staged the very successful **3C5DX** operation from Equatorial Guinea last year. The most difficult part of any Annobon operation, aside from getting there and back, is the visa and licensing hurdle. The last Annobon operation was in 1991, but groups have been trying for permission for many years.

Annobon has been the target of many high-powered DX types, some with success and others not. Neither Don Miller nor Gus Browning were able to secure the necessary paperwork. However, in the late 1960s a brash, as-yet-unknown young Finn decided he had what it took to put Annobon on the air for the first time. That brash young DXer was Martti Laine, OH2BH, who would go on to considerable DX fame.

From left: Abdollah, EP2FM, Harry, ZL2SQ/EP2BQ, Jamshid, EP2CN, and Mosood, EP2ES.

Martti, together with Ville, OH2MM, managed to get an audience with the president of the new country, who personally approved the Annobon license. Then the intrepid DXpeditioners had to find transportation to the remote island. They chartered a plane to fly to Libreville, the capital of nearby Gabon, for refueling, and then on to Annobon. When they took off on this flight, they weren't even certain there was a landing strip on Annobon.

To make a very long story short, they landed successfully and operated as **3CØAN**, putting Annobon on the DX map. This was, however, not the end of the story. Martti and Ville ended up spending a month in hospital in Finland, with three separate malaria infections. Obviously, this minor setback did not prevent these two DXpeditioners from going on to bigger and better operations. The full story of the 3C$$AN operation is in Martti's excellent book *Where Do We Go Next?*

DXpedition Planning

The following was plucked off the Internet DX Reflector. While the available positions have undoubtedly been filled by now, the list of qualifications and other aspects of the advance planning necessary to pull off even a small DXpedition halfway around the world should be of interest to all DXers. It's not easy!

DXpedition looking for DXpeditioners. Three positions are available for suitable candidates on a traditional DXpedition. We are looking for the following type people:

Good operator skills on SSB and CW, RTTY a plus; able to follow the instructions from the organizer once agreement has been made; able to work a pileup despite being abused and intentionally interfered; able to work self-reliant before and during the operation; ble to put the team effort in front of any personal ideas; ble to operate according to the team plan regardless of personal preferences; no fame guaranteed; hard work enforced; long and inconvenient hours; person must be capable of handling rough seas; be available for about six weeks during the months of September-October 1999; be able to live under harsh conditions; practical technical abilities are a big plus; good physical physique needed.

The successful DXpeditioner will be asked to pay up front the amount of US$1500 as participant fees. This price might be raised a bit if needed. All tickets, accommodation, and other related costs before and after the DXpedition have to be dealt with out of your own pocket. Once on the DXpedition everything will be from the common budget.

Reward: Personal satisfaction of having accomplished something out of the ordinary.

If you feel that you might qualify for this venture, then please send detailed list of your qualifications and information about your personality to the following address: <Home.Mats.Persson@wfp.or.ug>.

P.O. Box 50, Fulton, CA 95439
e-mail: <chod@compuserve.com>

The WPX Program

SSB

2707 .....DS4BHW 2709 .....K4LQ
2708 .....AE5DX 2710 .....JH1REP

CW

3012 .....IK6MNB 3013 .....K4LQ

Mixed

1837 .....K4LQ 1838 .....K8UPR

CW: 350 IK6MNB, K4LQ. 400 IK6MNB, K4LQ. 450 IK6MNB, K4LQ. 500 IK6MNB, K4LQ. 550 K4LQ. 600 K4LQ. 1400 WA2EYA. 1600 KS4S. 1650 KS4S. 1700 KS4S. 3600 N6JV.
SSB: 350 DS4BHW, AE5DX, K4LQ. 400 DS4BHW, AE5DX, K4LQ. 450 DS4BHW, AE5DX, K4LQ. 550 DS4BHW. 600 DS4BHW. 950 WD8ANZ. 1000 WD8ANZ. 1050 N1RT. 1650 KS4S. 1700 KS4S. 2400 KF7RU. 4299 ZK3BS.
Mixed: 450 K4LQ, K8UPR. 500 K4LQ, K8UPR. 550 K4LQ, K8UPR. 600 K4LQ, K8UPR. 650 K4LQ. 700 K4LQ. 750 K4LQ. 800 K4LQ. 950 WD8ANZ. 1000 WD8ANZ. 1350 ON4CAS. 1400 ON4CAS. 1550 AA1KS. 2050 JA1-2074. 2100 JA1-2074. 2150 JA1-2074. 2200 JA1-2074. 2250 JA1-2074. 2950 KS3F.

15 meters: AA1KS, K4LQ
20 meters: K4LQ

Asia: F5RRS, K4LQ
Africa: K4LQ
No. America: K4LQ
Europe: K4LQ

Award of Excellence Plaque Holders: K6JG, N4MM, W4CRW, K5UR, K2VV, VE3XN, DL1MD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, 9A2AA, OK3EA, OK1MP, N4NO, ZL3GQ, W4BQY, IØJX, WA1JMP, KØJN, W4VQ, KF2O, W8CNL, W1JR, F9RM, W5UR, CT1FL, W8RSW, WA4QMQ, W8ILC, VE7DP, K9BG, W1CU, G4BUE, N3ED, LU3YL/W4, NN4Q, KA3A, VE7WJ, VE7IG, N2AC, W9NUF, N4NX, SMØDJZ, DK5AD, WD9IIC, W3ARK, LA7JO, VK4SS, I8YRK, SMØAJU, N5TV, W6OUL, WB8ZRL, WA8YTM, SM6DHU, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, DK4SY, UR2QD, ABØP, FM5WD, I2DMK, SM6CST, VE1NG, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, HA8XX, K7LJ, SM3EVR, K2SHZ, UP1BZZ, EA7OH, K2POF, DJ4XA, IT9TQH, K2POA, N6JV. W2HG, ONL-4ØØ3, W5AWT, KBØG, HB9CSA, F6BVB, YU7SF, DF1SD, K7CU, I1POR, K9LJN, YBØTK, K9QFR, 9A2NA, W4UW, NXØI, WB4RUA, I6DQE, I1EEW, I8RFD, I3CRW, VE3MC, NE4F, KC8PG, F1HWB, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, KC7EM, YU1AB, IK2ILH, DEØDAQ, IQWXY, LU1DOW, N1IR, IV4GME, VE9RJ, WX3N, HB9AUT, KC6X, N6IBP, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, WØULU, K9XR, JAØSU, I5ZJK, I2EOW, IK2MRZ, KS4S, KA1CLV, KZ1R, CT4UW, KØIFL, WT3W, IN3NJB, S5ØA, IK1GPG, AA6WJ, W3AP, OE1EMN, W9IL, S53EO, DF7GK, I7PXV, S57J, EA8BM, DL1EY, KØDEQ, KU8A, DJ1YH, OE6CLD, VR2UW, 9A9R, UAØFZ, DJ3JSW, HB9BIN, N1KC, SM5DAC, RW9SG, WA3GNW, S51U, W4MS, I2EAY.

Award of Excellence Plaque Holders with 160 Meter Endorsement: K6JG, N4MM, W4CRW, N5UR, VE3XN, DL3RK, OKMP, N4NO, W4BQY, W4VQ, KF2O, W8CNL, W1JR, W5UR, W8RSW, W8ILC, G4BU, LU3YL/W4, NN4Q, VE7WJ, VE7IG, W9NUF, N4NX, SMØDJZ, DK5AD, W3ARK, LA7JO, SMØAJU, N5TV, W6OUL, N4KE, I2UIY, I4EAT, VK9NS, DEØDXM, UR1QD, AB9O, FM5WD, SM6CST, I1JQJ, PY2DBU, HI8LC, KA5W, K3UA, K7LJ, SM3EVR, UP1BZZ, K2POF, IT9TQH, N8JV, ONL-4ØØ3, W5AWT, KBØG, F6BVB, YU7SF, DF1SD, K7CU, I1POR, YBØTK, K9QFR, W4UW, NXØI, WB4RUA, I1EEW, ZP5JCY, KA5RNH, IV3PVD, CT1YH, ZS6EZ, YU1AB, IK4GME, WX3N, W5ODD, IØRIZ, I2MQP, F6HMJ, HB9DDZ, K9XR, JAØSU, I5ZJK, I2EOW, KS4S, KA1CLV, KØIFL, WT3W, IN3NJB, S5ØA, IK1GPG, AA6WJ, W3AP, S53EO, S57J, DL1EY, KØDEQ, DJ1YH, OE6CLE, HB9BIN, N1KC, SM5DAC, S51U.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage if airmail desired) to "CQ WPX Awards," P.O. Box 593, Clovis, NM 88101 USA.

Mats Persson, SM7PKK, certainly doesn't pull any punches on DXpeditioner requirements. The next time you are tempted to complain about a given DXpedition's operating practices, think back to this list. Would you qualify as an operator? If not, maybe you should just keep your mouth (and keyboard) quiet.

To continue this story, here is the press release that Mats and co-organizer Nils, SM6CAS, issued in June.

This is a traditional type DXpedition in the way we intend to operate. However, the targets are two instead of one with proper impact on both sites.

Bernie, W3UR, editor of "The Daily DX," operated from the new DXCC entity of Palestine.

The Primary target is T31 Kanton, a place that yet is very high on the most wanted lists around the world and has been a place of speculation for a long time.

The Secondary target is ZK3 Tokelau, some small often bypassed islands who yet have never seen a big multi-operator DXpedition. Despite in some areas not being high on the most wanted lists, the need is great.

The WAZ Program

Single Band WAZ

17 Meter Mixed

33 .....K9FD

17 Meter CW

26 .....N6AW

20 Meter SSB

1047 .....F5RRS 1048 .....W8JV

20 Meter CW

497 .....SM4AZQ 498 .....K9SUH

40 Meter CW

202 .....N4CH

80 Meter CW

52 .....G4BWP

RTTY

113 .....K3SWZ 114 .....K9EMG

RTTY 20 Meter

46 .....JR6LDE

WNZ 10 Meter SSB

61 .....KD4MTW

All CW

136 .....LU7EAR 138 .....K9GC
137 .....K6TTT

160 Meter WAZ

97 .....all 40 zones DJ6RX
67 .....38 zones DL3DXX
105 .....36 zones DL4MM
116 .....34 zones W2UE/7
101 .....37 zones G4BWP
125 .....39 zones OM2XW

All Band WAZ

SSB

4487 .....F6AOJ 4495 .....W7OIH
4488 .....N8MOT 4496 .....HL5AP
4489 .....IK1QFL 4497 .....HL5YAW
4490 .....W5PDW 4498 .....W7IAN
4491 .....KK5UY 4499 .....WD8RJR
4492 .....K6ESL 4500 .....W4IN
4493 .....N7VPN 4501 .....not issued
4494 .....N7VZU 4502 .....KU4BP

CW/Phone

7856 .....F5RMY 7864 .....IK1BPO
7857 .....SV2ASP/A 7865 .....WB3JFS
7858 .....S57AT 7866 .....NN4G
7859 .....W6XK 7867 .....SKØTM
7860 .....DF6SW 7868 .....KM4LS
7861 .....OH2BPA (all CW) 7869 .....UT4UZ
7862 .....HA1RW 7870 .....LA9VGA
7863 .....DL2AYJ 7871 .....K6TTT

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Manager, Jim Dionne, K1MEM, 31 DeMarco Road, Sudbury, MA 01776. The processing fee for all *CQ* awards is $4.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $10.00 for nonsubscribers. Please make all checks payable to the Award Manager. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. Questions regarding the WAZ Award may be sent to K1MEM with an SASE.

CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries. With few exceptions, the ARRL DXCC Countries List is used as the country standard. The CQ DX Award currently recognizes 330 countries. Honor Roll listing is automatic when an application is received and approved for 275 or more active countries. Deleted countries do not count and all totals are adjusted as deletions occur. To remain on the CQ DX Honor Roll, annual updates are required. All updates must be accompanied by an SASE if confirmation of total is required. The fee for endorsement sticker s is $1.00 each plus SASE. Please make checks payable to the awards manager, Billy F. Williams. All updates should be mailed to P.O. Box 9673, Jacksonville, FL 32208.

CW

K2TQC.....330
K2FL.....330
K6JG.....330
K2OWE.....330
N4JF.....330
K9BWQ.....330
K1MEM.....330
K2ENT.....330
K6LEB.....330
W2UE.....330
W6DN.....330
N7FU.....330
N4MM.....330
G4BWP.....330
K3UA.....329
EA2IA.....329
K2JLA.....329
W7OM.....329
KZ4V.....329
WØHZ.....329
K4CEB.....329
W4OEL.....329
N7RO.....329
K4CN.....329
F3TH.....328
K6GJ.....328
PAØXPQ.....328
WB5MTV.....328
WØIZ.....327
SM6CST.....327
W2FXA.....327
N4KG.....327
K8PV.....327
W4QB.....327
K9MM.....327
F3AT.....327
I1JQJ.....327
W7CNL.....327
I4LCK.....327
N5FG.....327
I4EAT.....327
DL8CM.....327
W1WAI.....327
K4IQJ.....326
NC9T.....326
IT9TQH.....326
WA4IUM.....326
4N7ZZ.....326
DJ2PJ.....326
W4LI.....325
K9IW.....325
I5XIM.....325
WA8DXA.....325
N5FW.....325
IK2ILH.....325
9A2AA.....325
OK1MP.....325
W8XD.....324
K8LJG.....324
DL3DXX.....324
N6AR.....324
IT9VDQ.....324
W6SR.....323
VE7CNE.....323
IT9QDS.....323
K5UO.....322
KA7T.....322
KUØS.....322
ON4QX.....321
KA5TQF.....321
K9QVB.....321
HA5DA.....321
K6CU.....321
N4CH.....320
IT9ZGY.....320
HA5NK.....319
K2JF.....319
VE7DX.....318
N6AV.....318
VE7DX.....318
I2EOW.....318
G3KMQ.....317
NØFW.....317
LA7JO.....316
N5HB.....316
K4JLD.....316
K8JJC.....315
AA2X.....314
WB4UBD.....313
N1HN.....313
YU1AB.....312
K9DDO.....312
W3II.....312
YU1AB.....312
K1VHS.....311
K7JS.....311
WA8YTM.....311
N6AW.....311
OH3NM.....310
OZ5UR.....310
VE9RJ.....309
9A2AJ.....309
HB9DDZ.....307
WG5G/QRPp..307
W4UW.....307
W7IIT.....305
CT1YH.....305
KE5PO.....304
G2FFO.....303
IKØADY.....302
K1FK.....302
N4OT.....301
W6YQ.....300
KH6CF.....300
YV5ANT.....299
KØHQW.....299
PY4WS.....298
K9FYZ.....297
LU3DSI.....295
G4MVA.....294
F6HMJ.....292
KB8O.....292
DJ1YH.....288
YU7FW.....286
EA3BHK.....282
YC2OK.....280
EA2CIN.....278
KF8UN.....276
G3DPX.....275

SSB

K4MZU.....330
K2TQC.....330
K2FL.....330
EA2IA.....330
W6EUF.....330
K2JLA.....330
K6JG.....330
K6GJ.....330
N4MM.....330
K2ENT.....330
N4JF.....330
VE1YX.....330
K5TVC.....330
K6YRA.....330
YU1AB.....330
PY4OY.....330
XE1L.....330
W7OM.....330
K4MQG.....330
I4LCK.....330
VE3MR.....330
K7LAY.....330
W7BOK.....330
4N7ZZ.....330
IK1GPG.....330
IK8CNT.....330
K5OVC.....330
DJ9ZB.....330
W6DN.....330
NØFW.....330
N7RO.....330
KZ2P.....330
EA4DO.....330
ZL3NS.....330
OE3WWB.....330
XE1VIC.....330
K9FYZ.....330
VE3XN.....330
K3UA.....329
K1UO.....329
W7FP.....329
K9BWQ.....329
VE3MRS.....329
N5FG.....329
WS9V.....329
ZL1AGO.....329
I8KCI.....329
4Z4DX.....329
N4CH.....329
KØKG.....329
WØYDB.....329
DL9OH.....329
K4CN.....329
W4UW.....329
W8ZET.....329
K8CSG.....329
LA7JO.....328
OE2EGL.....328
KZ4V.....328
K4JLD.....328
I2EOW.....328
W4NKI.....328
PAØXPQ.....328
VK4LC.....328
VE2WY.....328
VE2PJ.....328
W2JZK.....328
W6BCQ.....327
VE7DX.....327
AA6BB.....327
SM6CST.....327
W3GG.....327
I4EAT.....327
W4UNP.....327
F9RM.....327
OZ3SK.....327
CX4HS.....327
K7JS.....327
DU9RG.....327
IT9TQH.....327
IT9TGO.....327
WD8MGQ.....327
I1EEW.....327
IØZV.....327
SV1ADG.....327
VE3XN.....327
K9MM.....327
DL8CM.....327
KE4VU.....327
I1JQJ.....327
K9PP.....327
OZ5EV.....327
CT1EEB.....327
W9OKL.....327
W4QB.....326
WB4UBD.....326
W2FXA.....326
K8PV.....326
NC9T.....326
K5UO.....326
W6SR.....326
W4LI.....326
WDØBNC.....326
N4KG.....326
VE2GHZ.....326
KA3HXO.....325
KF7SH.....325
YV5AIP.....325
K9IW.....325
WA4JTI.....325
YV1AJ.....325
YV1KZ.....325
DL6KG.....325
9A2AA.....325
OK1MP.....325
WB3CQN.....325
I2QMU.....325
KB4HU.....325
KC4MJ.....325
CX2CB.....325
W9SS.....325
WA4IUM.....325
VE3GMT.....325
W4EEE.....325
KE4VU.....325
WA4WTG.....325
WD8PUG.....325
W2CC.....325
PT2TF.....325
KM2P.....325
N5FW.....325
K9HDZ.....325
WA3HUP.....325
YV1CLM.....325
N6AW.....325
ZP5JCY.....325
WB3DNA.....325
XE1AE.....325
KE5PO.....325
TI2CC.....325
K1HDO.....325
YV5IVB.....325
KD8IW.....325
W8KS.....325
N2VW.....325
IKØIOL.....325
YU1HA.....325
N6AR.....324
I8LEL.....324
IT9ZGY.....324
K6LEB.....324
IK1GPG.....324
VE7WJ.....324
AI8S.....324
AC7DX.....324
KØHQW.....324
K2JF.....324
KC8EU.....323
VE4ACY.....323
W2FGY.....323
YV5CWO.....323
I8KCI.....323
VE4AT.....323
K4JDJ.....323
KA5TTC.....323
KB2MY.....323
EA3BKI.....323
K8YVI.....322
K9HQM.....322
KC5P.....322
WW1N.....322
W6SHY.....322
W3AZD.....322
CE7ZK.....322
LU7HJM.....322
K5NP.....322
KB8O.....322
YV1JV.....322
VE4ROY.....321
XE1CI.....321
LZ1HA.....321
WA5HWB.....321
TI2JJP.....321
W8AXI.....321
W6MFC.....321
EA8TE.....321
W5XQ.....320
KA5TQF.....320
W7ULC.....320
TI2HP.....320
WØULU.....320
KB1HC.....320
OA4QV.....320
OE6CLD.....320
W5RUK.....320
LU1JDL.....320
KF8VW.....320
G4ADD.....320
I4WZK.....320
I4SAT.....320
K6BZ.....320
EA3EQT.....320
KØFP.....320
KE3A.....320
N4CSF.....320
NI5D.....320
N4HK.....320
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AE5DX.....320
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KB1JU.....319
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N6RJY.....319
ON5KL.....319
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I8IYW.....318
WA8YTM.....318
KX5V.....318
CE1YI.....318
K4JDJ.....318
ZL1BOQ.....318
K9QVB.....318
WA6DTG.....317
EA1JG.....317
N5HSF.....316
K6RO.....316
WS9V.....316
W6NW.....315
KV2S.....315
WA9RCQ.....315
N3ARK.....315
K7TCL.....315
I4CSP.....315
WB8ZRV.....314
NØAMI.....313
OH5KL.....313
WDØDMN.....313
K9YY.....313
W9IL.....313
W1LQQ.....313
KD5ZD.....312
N5HB.....312
IN3ANE.....311
F1OZF.....311
EI6FR.....311
YZ7AA.....311
GM4XLU.....311
KA5RNH.....310
I2MQP.....310
HA6NF.....310
KF7RU.....310
AB4IQ.....310
W4WX.....310
EA5RJ.....309
EA5KY.....308
EA3CB.....308
EA3BHK.....307
VE3CKP.....307
N6AV.....306
TI2TEB.....306
VE3DLR.....306
W3YEY.....306
XE1MDX.....305
DK5WQ.....305
EA5OL.....305
WB2AQC.....305
K6CF.....304
KC4FW.....304
EA5GMB.....304
EA3CWK.....303
EA3BT.....303
YC2OK.....303
WB2NQT.....303
CT1YH.....302
W5GZI.....302
N5QDE.....302
KD4YT.....302
RA2YA.....301
W2LZX.....301
N3RX.....301
YT7TY.....300
W5OXA.....300
K3LC.....300
WA4ZZ.....300
WZ3E.....300
YV4VN.....299
LU3HBO.....299
K6GFJ.....299
KJ9N.....298
SV3AQR.....296
KB5WQ.....295
SV1RK.....295
4X6DK.....295
YT1AT.....294
IT9VDQ.....293
KJ5LJ.....293
K2EEK.....293
W6WL.....291
YB1RED.....291
DJ2UU.....291
WA3KKO.....290
OE7KWT.....290
N6CFQ.....290
WG7A.....290
IK2PZG.....289
VK3IR.....289
KF7VC.....288
OK1AWZ.....287
IK2DUW.....287
EA5GMB.....287
TU2QW.....286
NM5O.....285
EA1AYN.....285
VE7HAM.....285
IK2HBX.....284
F5RRS.....284
KE6CF.....283
KK4TR.....283
K7HG.....283
WN6J.....281
CP2DL.....281
YU1TR.....280
KN4RI.....280
WD9ACQ.....280
OA4EI.....280
KK5UY.....280
WØIKD.....279
EA3CWT.....278
LU5EWO.....278
EA3CWT.....278
9A9R.....277
K3LC.....277
VE2DRN.....277
KC6AWX.....276
SV2CWY.....276
W6UPI.....276
F5NBX.....275

RTTY

K2ENT.....325
W2JGR.....316
WB4UBD.....309
NI4H.....305
K3UA.....302
I1JQJ.....289
G4BWP.....287
EA5FKI.....284
W4QB.....280
W4EEU.....280
YC2OK.....280
KE5PO.....274
PAØXPQ.....272

The initial itinerary is as follows: T31, 23 September to 3 October 1999; ZK3, 7 October to 12 October 1999.

We intend to have three stations with 1 KW. These will be manned by six operators. There will be beams for the all the higher bands including the WARC bands and verticals for the low bands. The operation will feature one SSB site, one CW site, and one WARC/Lowband/RTTY site.

The vessel transporting the team has already been secured and the total travel time for the participants expands over six weeks. The rough budget for this DXpedition is about US$30,000 not counting the personal tickets and hotels to the takeoff site for the DXpedition. The DXpedition is looking for additional funds from clubs and foundations.

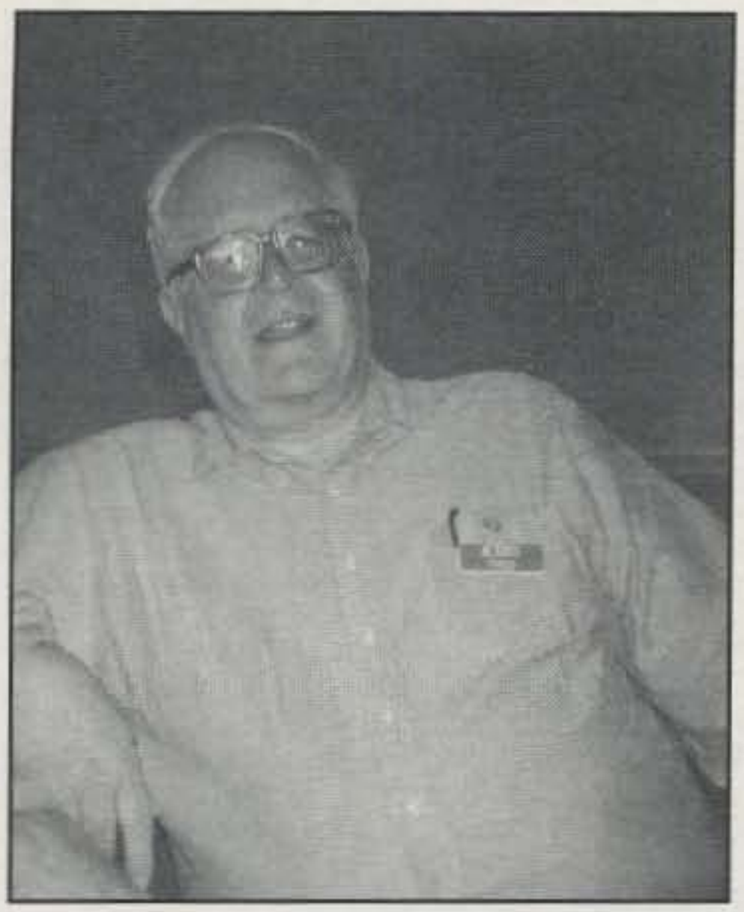
Every operator pays $1500. No more. This includes everything from the day we depart KH8 until the day we arrive in Okt. You pay your own expenses such as air tickets, hotel, food, etc., before and after the expedition.—*Mats and Nils*

DX News

US postage rates to Canada have increased slightly. It now costs 48 cents to mail a half-ounce letter to Canada and 55 cents for a one-ounce letter. Two nesting airmail envelopes and a QSL card will fit under the half-ounce limit; otherwise, go for the 55 cents.

The "DX News Sheet," produced in recent years by the RSGB, has ceased publication. CQ Hall of Famer Geoff Watts founded the "DX News Sheet" and edited it for 20 years (1962-1982). It has long been the standard against which other DX newsletters are measured. The rapidly growing availability of DX information on the Internet was a factor in the decision to cease publication.

In May, Baldur, DJ6SI, and CQ Hall of Famer Franz Langner, DJ9ZB, operated from Somaliland under Baldur's call of **6OØX** (QSL direct to DJ6SI). Somaliland declared its independence from Somalia in 1991. It has its own elected parliament



Fred Laun, K3ZO, is active in a contest most weekends.

and government. However, to meet the new DXCC criteria for separate "entity" status, it would have to meet one (or more) of the three Point 1 requirements: membership in the UN, a unique callsign block assigned by the ITU (as in the case of Palestine), or have a separate IARU member society. Somaliland lacks all three requirements and thus cannot be a separate DXCC entity at this time.

DXpeditions, Special Events

Bob, W2SF, will operate from Iceland Aug. 26 to Sept. 6 as **W2SF/TF**. He'll be on 80–10 meters, including the new bands, on CW, SSB, and RTTY. QSL home call.

Jun, JH4RHF, will operate **4U1VIC** from the Vienna International Centre during WAE SSB, WW RTTY, CQWW CW, and CQWW SSB in a multi-multi. Note that CT might not recognize 4U1VIC. QSL via the Austrian bureau or as advised.

The Southern Counties Amateur Radio Association (SCARA) will operate **K2BR** as a special-event station from the Miss America Pageant in Atlantic City, New Jersey. The station will be active 1400Z Sept. 13 to 0400Z Sept. 19. Try 7050, 14050, 21050, and 28030 kHz on CW and 7250, 14250, 21325, and 28325 kHz on SSB. QSL with a #10 return envelope to SCARA, P.O. Box 121, Linwood, New Jersey 08221.

Deryck, **ZS8D**, is on Marion Island, but not very active. He'll be stationed there until next May.

DX Gatherings

The eighth annual New Orleans International DX Convention is August 27–29 at the Royal Sonesta Hotel in the historic French Quarter of New Orleans. Make your reservations directly with the hotel at 504-586-0300, and mention the DX convention to get the special room rate. Convention reservation forms are available at web site: <gnofn.org/~w5ru/>. On Friday afternoon the program includes DXCC card checking and DXpedition videos. The Saturday program features a DXCC update, Wake Island, Pratas, IOTA, Marshall Islands, Eritrea, Rodrigues, and more. The dinner speaker is Frank Smith, AHØW, and he will be speaking on the XU1A Cambodia operation. Note that coats and ties are recommended dress for the men at dinner. There is also a hospitality suite sponsored by Carl Smith, N4AA, both Friday and Saturday evenings. Bring your laser pointer. I'll see you all there!

The 1999 Radio Society of Great Britain (RSGB) holds its International HF and IOTA Convention Oct. 8–10 at the Beau-

5 Band WAZ

As of June 30, 1999, 494 stations have attained the 200 Zone level.

New recipients of 5 Band WAZ Award with all 200 Zones confirmed:

YB5QZ

The top contenders for 5 Band WAZ (zones needed, 80 meters):

N4WW, 199 (26)	W3NO, 199 (26)
W4LI, 199 (26)	K4UTE, 199 (18)
K7UR, 199 (34)	K5RT, 199 (23)
WØPGI, 199 (26)	UT5UGR, 199 (10)
W2YY, 199 (26)	K4PI, 199 (23)
VE7AHA, 199 (34)	HB9DDZ, 199 (31)
IK8BQE, 199 (31)	UA3AGW, 198 (1, 12)
JA2IVK,199 (34 on 40)	EA5BCK, 198 (27, 39)
K1ST, 199 (26)	G3KDB, 198 (1, 12)
ABØP, 199 (23)	KG9N, 198 (18, 22)
KL7Y, 199 (34)	DKØEE, 198 (19,31)
NN7X, 199 (34)	KØSR, 198 (22, 23)
OE6MKG, 199 (31)	K3NW, 198 (23, 26)
HA8IB, 199 (2 on 15)	UA4PO, 198 (1, 2)
IK1AOD, 199 (1)	JA1DM, 198 (2, 40)
DF3CB, 199 (1)	9A5I, 198 (1, 16)
F6CPO, 199 (1)	K4ZW, 198 (18, 23)
W6SR, 199 (37)	OH2VZ, 198 (1, 31)
W3UR, 199 (23)	RAØFA, 198 (2 on10,15)
KC7V, 199 (34)	LA7FD, 198 (3, 4)
GM3YOR, 199 (31)	K5PC, 198 (18, 23)
VO1FB, 199 (19)	NT5C, 198 (18, 23 on 40)
KZ4V, 199 (26)	VE3XO, 198(23, 23on40)
N4CH, 199 (18 on 10)	K4CN, 198 (23, 26)
OE1ZL, 199 (1)	KF2O, 198 (26, 26)
W6DN, 199 (17)	

The following have qualified for the basic 5 Band WAZ Award:
Endorsements:
1094 Stations have attained the 150 Zone level as of June 30, 1999.

W6BCQ, 196 zones	KF2O, 198 zones,
K4IQJ, 197 zones	K5TN, 190 zones

****PLEASE NOTE: Due to supplier increases, effective September 1, 1998 cost of the 5 Band WAZ Plaque is now $80 ($100 if airmail shipping is requested).**

Rules and applications for the WAZ program may be obtained by sending a large SAE with two units of postage or an address label and $1.00 to: WAZ Manager, Jim Dionne, K1MEM, 31 DeMarco Road, Sudbury, MA 01776. The processing fee for all *CQ* awards is $4.00 for subscribers (please include your most recent *CQ* mailing label or a copy) and $10.00 for nonsubscribers. Please make all checks payable to the Award Manager. Applicants sending QSL cards to a *CQ* checkpoint or the Award Manager must include return postage. Questions regarding the WAZ Award may be sent to K1MEM with an SASE.

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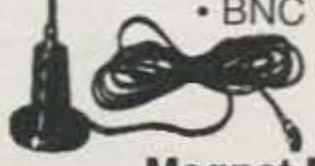
- BNC CAT# DB-6



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QSL INFORMATION

1B/DJ7RJ to DJ7RJ
1B/DL6NBR to DL6NBR
3A/F5RUQ to F5RUQ
3A/HB9APJ to HB9APJ
3B8/G4LJF to G4LJF
3DAØJA to JH7FQK
3Y5NT to PIRATE
4F1RWW to DL4OCM
4KØCW to DL6KVA
4N2AJ to 9A2AJ
4X4UH to W3HNK
4Z5JQ to K2OVS
5B4/G3VMW to G3VMW
5V7ZM to G3ZEM
5Z4UQ to W3HNK
8P6JW to K2QIE
8Q7IO to DL7VRO
9A77ON to 9A1DAB
9H3ZZ to VE3ZZ
9K7POW to 9K2RA
9N7RW to GØDIZ
A9/ON4CFI to ON4CFI
ATØU to VU2UR
AX4MGA to VK4FW
C4A to 9A2AJ
C6GI to C6AFV
CN8WW to DL6FBL
CX9AU to KA5TUF
DU1ODX to NHØE
E44/OK1DTP to OK1TD
E44DX to OH2BN
EL2TT to ON5NT
ER2ØØP to ER1DA
EW9Z to PIRATE
FG/PA3ERC to PA5ET
FK/F6BUM to F6BUM
FM/PA3EWP to PA5ET
FOØCLA to F6LQJ
FT5ZH to F6KDF
GS7UEG/P to G7DKX
GW4VEQ/P to G4VEQ
HBØ/DL6MHW to DL3ABL
HH2NH to KU9C
HO3A to KG6UH
HSØ/JR3XMG to JG3AVS
IQ4B to IK4QJH
J6/PA3EWP to PA5ET
J77C to PA5ET
JD1/JG1WEH to JG1WEH
JU1T to JT1KAA
KHØ/JI1UHZ to JI1UHZ
KHØ/JR2BUM to JR2BUM
KP2/W6KK to W6KK
LT1F to LU1FKR
MSØBPG/P to G7DKX
N4B to KKØDX
OE4A to OE1EMS
OHØXY to OH6XY
OZ/TF3CW to LX1NO
P29VH to VK4FW
PJ2/K3UOC to W1AF
PJ5AA to W1AF
PR59B to PP5LL
PZ5JR to K3BYV
RA6AX to W3HNK
RU3DOV/EW8 to Pirate
SN2B to SP2FAX
SN4PL to SP2PI
SN4PLJ to SP2UKB
SN4PLN to SQ2EAP
SV5/SV8CYV/P to SV8CYV
SV8/G3SWH to G3SWH
T3ØD to VK4FW
T32IW to DJ5IW
TA4/DL5MAE to DL5MAE
TA4/TA3YJ/P to TA3YJ
TMØP to F6BFH
TM6T to F6CHT
TO5C to PA5ET
TU5A to W8AEF
UA0MF to W3HNK
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UN5G to UL8GWJ
UN9LX to DL6KVA
UPØF to W3HNK
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UY1U to UT5UN
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V8THG to JH7FQK
VE3DZR to KD3FM
VK9CT to VK4FW
VK9XO to VK4FW
VO1AA to VO1HE
VP5/PA3EWP to PA5ET
VP5J to KK9A
VR2BG to VS6BG
W5RXP/KH3 to W5RXP
WP3R to W3HNK
XT2DP to WB2YQH
XV6JP to JA1IED
YB3OSE to W7TSQ
YB8BHC to KG2FH
YI1WL to IK2DUW
YR3ØAIR to YO6KBM
YU4AU to YU4WU
YV4/K3UOC to W1AF
YW7C to W4SO
ZA/OK1TN to OK1TN
ZA/OK5DX to OK1TN
ZD8V to KF4OOX
ZD9CR to KA1DE
ZL7DK to DK7YY
ZS/OK1TN to OK1TN
ZT6Z to ZS6EZ
ZZ2Z to AC7DX
9H1BL to Silvio Migneco, Morden Flats, Main Str., Mosta, MST 06, Malta
A92GK to Rajesh Nambiar, P.O. Box 5542, Manama, Bahrain
BD2MF to Zhang Jinyi, Changchun Institute of Posts and Telecommunications, 20 Nanhu Road, Changchun, Jilin 130012, China
BD5WW to Cao Jian Jun, P.O. Box 321, Qingliu, Fujian 365300, China
BD7LQ to Qiang Zhi, P.O. Box 771, Guangzhou 510120, China
BD9SD to Zeng, P.O. Box 178, Xining 810005, China
BG2LT to Dong Xin Yie, P.O. Box 1157, Changchun, Jilin 130022, China
BG3DX to Zhao Chun-Yun, No. 4 Building 3-502, Guangming East Lane, Xianshuigu Town, Jinnan District, Tianjin 300350, China
BG4RBY to Zhan Ge, P.O. Box 538, Nanjing 210029, China
BG4XAA to Kevin Yang, P.O. Box 37, Lianyungang 222002, China
BG4XUA to Ming-Rong Ma, P.O. Box 37, Lianyungang 222002, China
BG5QAD to Lin Bill, P.O. Box 519, Fuzhou, Fujian 350012, China
BG7KU to Yi Quan, No. 131 Xian Lie Dong Rd., Guangzhou 510500, China
BG7OH to Mars Liu, P.O. Box 01-368, Shenzhen 518001, China
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BG8CG to Dai Hua, P.O. Box 2109, Chongqing 400014, China
BG8GK to Minjie Zhang, P.O. Box 2514, Chongqing 400060, China
BG8GQ to Xu Bo, P.O. Box 2109, Chongqing 400014, China
BG8KW to P.O. Box 2109, Chongqing 400014, China
BG9AX to Wang De Jiang, 202 Long Shuo Bei Lu, Dong Duan, Xi An 710016, China
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CU3FT to Carlos Poinho, P.O. Box 140, P-9702 Angra, Terceira, Acores, Portugal
DS2JJV to Young-Hwan Choi, 236-27, Sang-dong, Wonmi-gu, Buchon-city, Kyonggi-do 420-030, Korea
DS3CCQ to Min-Cheol Lee, 302-1207 Hyangchon APT, Shinbang-dong, Chonan 330-260, Korea
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FG5FY to Edmond Lucien, B. P. 20, F-97113 Gourbeyre, France
FG5HM to Emile Alexis, 10 Lot. L'Oree du Pare, F-97170 Petit Bourg, France
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SV3KH to Nikos Georgakopoulos, P.O. Box 15, GR-271 00 Pyrgos, Greece
TA1AT to Naci Pomak, P.O. Box 118, TR-34842 Avcilar, Istanbul, Turkey
V5/HB9QQ to Pierre Pasteur, Sunnhaldenstrasse 28a, CH-8600 Duebendorf (ZH), Switzerland
VR2LC to Ken Kwok, P.O. Box 89381, Hong Kong, China
VU3GBD to Vinod K. Puthiyamadom, Thevannoor P.O., Ayoor, Kollam 691 533, Kerala, India
XX9ARM to Associacao de Radio-amadores de Macau, P.O. Box 6018, Macau
XX9JUV to Centro Juventude do Forum Club Station, P.O. Box 6018, Macau
YBØFMT to Yon, P.O. Box 1234, Jakarta 11012, Indonesia
YBØJAX to Ir. John Andries, P.O. Box 599 - CPA, Jakarta 15401, Indonesia
YB4TEM to Tarmizi, Jl. Alam Jaya No. 2 Way Halim Permai, Bandarlampung 35131, Indonesia
YB4ZDZ to ORARI Lokal Tanjung-karang Timur Club Station, P.O. Box 234, Tanjungkarang, Bandar Lampung 3500, Indonesia
YB7VR to Ir. Azwar Makmur, P.O. Box 455, Balikpapan 76100, Indonesia
YCØROY to Roy Siregar, Perm Kalideres Permal, Blok H5/17, Jakarta 11840, Indonesia
YC0YSV to R. M. Sidharto, P.O. Box 118, Bekasi 17011, Indonesia
YDØJVX to Setianto Wirjotanojo, Jl. Kelapa Gading Bulevard, Blok PA 11 No. 1, Jakarta Utara, Indonesia

The table of QSL managers is courtesy of John Shelton K1XN, editor of The Golist, P.O. Box 3071, Paris TN 38242, phone 901-641-0109; e-mail: <golist@ wk.net >

mont Conference Centre, Old Windsor, Berks. The programs includes CT1SX in the Pacific, CQWW from West Africa, solar eclipse results, ZL9CI DXpedition, code breaking at Bletchley Park, and more. Information is available from Marcia Brimson, 2E1DAY, 44(0) 1707 659015 or e-mail at <marcia.brimson@rsgb.org.uk>.

The 47th annual W9DXCC convention and banquet is Saturday, Sept. 18, at the Holiday Inn in Rolling Meadows, Illinois. The program includes E44DX from Palestine, 3B9R, BQ9P, VK9XX, T88II, VP5CW, and much more. Bill Kennamer, K5FUV, will be on hand to check DXCC QSL cards. Banquet speaker is Dave Heil, 5H3US. The banquet also features the DX Hog of the Year award. More information is available from Bill Smith, W9VA, at 847-945-1564, e-mail: <w9va@aol.com>. Their web site is <qth.com/w9DXcc>.

The Clipperton DX Club hold's their annual convention Sept. 18–19 at the hotel Mercure of Mulhouse Sausheim. F5PAC is organizing the event. More information is available at <multimania.com/cDXc/>.

CQ DX Awards Program

SSB

2275	SV3AQR	2277	W8ZET
2276	F5RRS	2278	HJ3PXA

CW

992	W5UE

SSB Endorsements

320	W4UW/329	275	K2EEK/293
320	DL9OH/329	275	F5RRS/284
320	W8ZET/329	275	W6UPI/276
320	K8CSG/329	200	HJ3PXA/00
320	N5ZM/328	OSCAR	F5RRS
310	CT1EEN/319	28 MHz	F5RRS
275	SV3AQR/296	1.8 MHz	K1FK

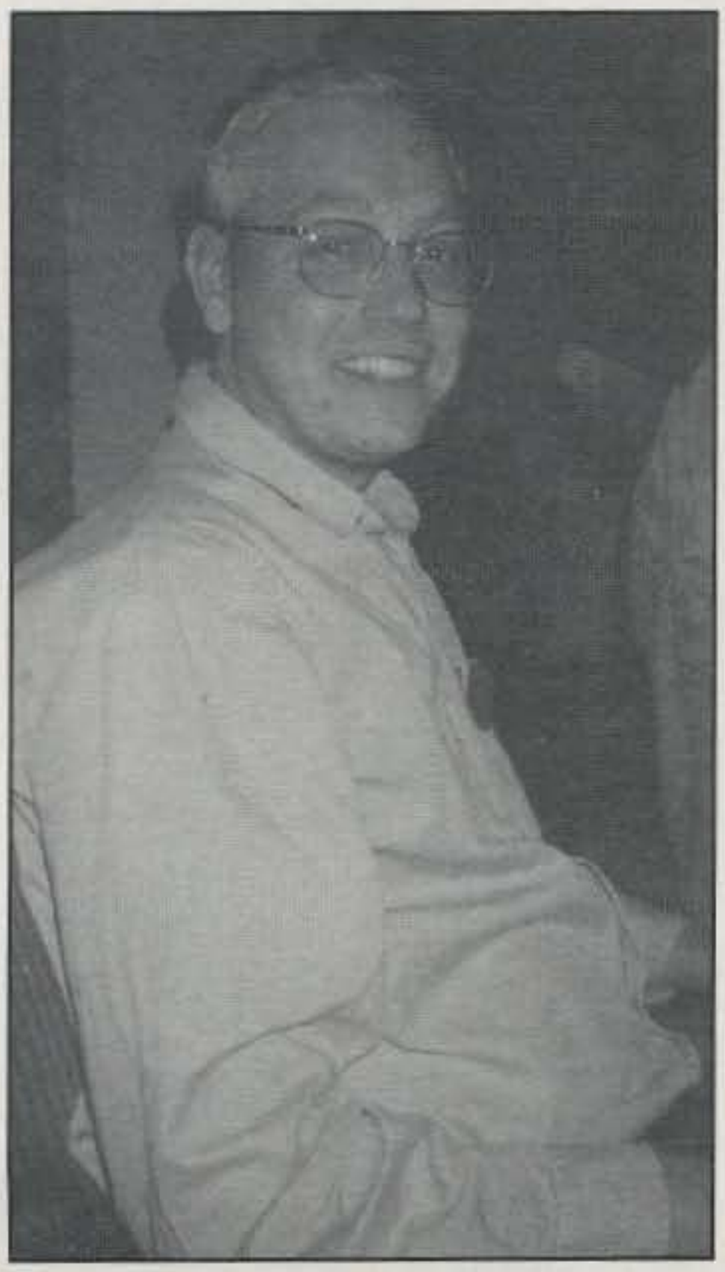
CW Endorsements

320	WB5MTV/328	320	N4AH/320
320	K6CU/321	150	PY4WS/298

The basic award fee for subscribers to *CQ* is $4. For non-subscribers, it is $10. In order to qualify for the reduced subscriber rate, please enclose your latest *CQ* mailing label with your application. Endorsement stickers are $1.00 each plus SASE. Updates not involving the issuance of a sticker are free. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business-size, No. 10, self-addressed, stamped envelope to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. Currently we recognize 330 active countries. Please make all checks payable to the award manager.

The 27th SEANET Convention is Nov. 19-21 in Brunei. For details, contact Haji, V85HG, at <v8hg@brunet.bn>; Gary, V8GTW, at <gwoods@brunet.bn>; or Gerald, V85GA, at <gerald@brunet.bn>.

DX news and events are here thanks to Bernie McClenny. W3UR, Editor of "The Daily DX," 3025 Hobbs Road, Glenwood, MD 21738 (fax 301-854-5105; <http://www.dailyDX.com>).



Mats Persson, SM7PKK, is off on the Pacific DXpedition trail again this month.

DX Club Officers

The 1999-2000 officers of the San Diego DX Club are: President Pat Bunsold, WA6MHZ; Vice-President Art Charette, K6XT; Secretary/Treasurer, Harry Hodges, W6YOO; Board: Jim Stevenson, W6YI, Cliff Smith, K6TWU, and Sam Johnson, W6BS; Newsletter Editor Erich Bennett, W6LKK; and Webmaster Mike Breaux, AC6FM.

The new officers of the Northern California DX Club are: President Dick Letrich, W6KM; Vice-President Chuck Patterson, K6RK; Secretary Bill Fontes, W6TEX; Treasurer Bill Maurer, WB6JJJ; and Directors Marilyn Bagshaw, N6VAW, Ron Panton, W6VG; and Don Anastasia, AA6W.

QSL News

Larry Laflamme, N1SHM, is now handling QSLs for Ed Tenhulzen, **A92GJ**. Larry's address is 474 Second Avenue, Belin, NH 03570, or via the W1 bureau.

Joe, W1EK, reports that he is *not* QSL manager for VP2E. He *does* handle cards for his own Anguilla callsign, **VP2EJR**. He will be getting cards out for his October 1998 operation soon.

QSL **8P6AW** direct to the Amateur Radio Society of Barbados, Box 814-E, Saint Michael, Barbados. Neither WB4RRK nor K1XN are QSL managers for this station.

Steve Hurst, KA7NOC, reports that he is *not* manager for YU1OJ. YU1OJ says he doesn't want a QSL manager at this time. QSL direct.

The W2 incoming QSL bureau passes notice that neither **WB2K** nor **WA2JUN** are accepting cards from the bureau. WB2K is QSL manager for the Zone 2 station VE2QRZ, and WA2JUN is manager for ZL7HI and ZL7OK. QSL these station direct, and mention that this no-bureau policy is a violation of DXCC's QSL policy and can lead to disqualification.

The new address of Dans Simenson, **LAØHI**, is Post Box 148, 6650 Surnadal, Norway.

Sam, CT1EEN, says he has been getting cards for Angelo, **D44BS**. Sam is not the manager for D44BS and can only answer cards for his own operation Aug. 1-8, 1995. Other cards should go direct to Angelo.

A typo snuck into the June column. **K3BYV** is the manager for **P29NB**.

The Golist has a new web site and some new features. Visit it at <www.itis.net/golist/>. 73, Chod, VP2ML

RADIO WORKS

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SuperLoop 80,	112' long, 80 -10 m. Want the best?	$96.95
SuperLoop 40,	56' long, 40 -10 m. Ready for DX	$84.95
CAROLINA WINDOM 80,	80 -10 m, 132' long	$84.95
CW 40,	40-10, 66', helped set 40 m records - terrific!	$82.95
CAROLINA BEAM 80,	80-10m,100' long.Powerful	$105.95
CAROLINA WINDOM 160,	160 -10m, 252' Big Bang	$119.95
BigSig 40,	3/2 wave loop, 40 m, 110' A Sizzler	$69.00
G5RV Plus,	80-10m, 102'+ High Power Current Balun	$57.95

Current Baluns

B1-2K	1:1	2 KW	80 -10 m	Current Balun	$20.95
B1-5K	1:1	5 KW	160 -10 m	Precision	$31.95
B1-1KV	1:1	1 KW	15 - 2 m	VHF Current Balun	$25.95
Y1-5K	1:1	5 KW	160 -10 m	The YagiBalun™	$33.95
B4-1KXV	4:1	1 KW	15 - 2 m	VHF Current Balun	$29.95
B4-2KX	4:1	2 KW	160-10 m	4:1 Current Balun	$42.95
RemoteBalun™				High Power, Current-type, 4:1, 160-10 m	$49.95

NEW! RFI Quick Fix

For really tough RFI and RF feedback problems, you can't beat the new T-4 and T-4G Ultra Line Isolators. It's isolation factor is 50% higher than previous models. The T-4G goes even further with a built-in ground strap for direct Line Isolator grounding. Before coax enters your station, stray RF is shunted directly to ground. Use with Vertical antennas, install two T-4's between transmitter, linear and tuner to break up ground loops. Use the T-4 with any antenna to reduce feedline radiation. This is the RFI Big GUN. T-4G $33.95

New! VHF Baluns
B1-1KV 1:1 and B4-1KXV 4:1
Line Isolators T-6 and T-6G

Line Isolators, 50 Ohms, High power

T-4	Ultra Line Isolator, maximum RFI protection	$29.95
T-4G	Identical to T-4G without direct grounding	$33.95
T-6	VHF version of T-4 15 - 2 meters, 1 KW	$25.95
4K-LI	Line Isolator, SO-239 in and out	$21.95

September Specials

PL-259	Silver & Teflon	$1
RG-8X	Premium, 95%	13¢
RG-213	Mil-type, 95%+	33¢

Antenna Wire and Parts

PL-259ST	Silver-Teflon, USA	SALE $1.00
PL-259GT	Gold-Teflon, USA	$1.49 or $30/pk of 25
N/9913	For 9913, 9086, Flexi, etc.	$3.25
N/9913S	As above but Silver & Teflon	$4.25
N-200	'N' Silver-Teflon, installs like PL-259	$3.00
	Coax & Cable Prices	<100'/100'+
RG-8X	Premium grade, 95% braid, SALE	19¢/13¢
RG-8X Plus	95% shield, type IIA non-contaminating	26¢/22¢
RG-213 Plus	Enhanced, 96%+ super jacket	45¢/38¢
RG-213	Top Quality, 95% (Sale on 100' or more)	33¢
ExtraFlex	Flexible, 9913 type	57¢
R1 Rotator	8 conductor (2 x #18, 6 x #24) SALE	26¢/20¢
R2 Rotator	8 conductor (2 x #16, 6 x #18) SALE	47¢/35¢
#14 HD	Stranded, 7 x 22 hard-drawn	8¢
#14 FlexWeave™	168-strand, bare for any wire ant.	14¢
#12 FlexWeave™	259-strand, excellent for longer runs	19¢
450 Ladder	#16 stranded cond, windows SALE	22¢/16¢
450 Ladder	New! #14 stranded cond. poly SALE	30¢/24¢
1/2" Braid	Tinned copper, for ground systems	65¢

Pulleys - for antenna support rope. Highest quality, small, lightweight sailboat type for fibrous rope - for 3/16" rope $11.95 or 5/16" rope $14.95

Antenna Support Line MilSpec Dacron, single braid, solid, fungus & sun resistant line. 3/16" 700# test 100' hanks $8
Kevlar - no stretch, .075" dia. 500# test, Dacron jacket 200' spl $15.95

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NEW! General Catalog 981 80 pages of HF and VHF baluns, Line Isolators, high performance wire antenna systems, wire, cable, coax, connectors, station accessories, tuners, coax switches, support line, etc. If you don't shop here, you won't get the best prices! Free, allow 2-3 weeks for bulk mail or send $2 for Catalogs by Priority Mail

CIRCLE 78 ON READER SERVICE CARD

BAND-BY BAND BREAKDOWN—TOP ALL BAND SCORES

Number groups indicate: QSOs/Zones/Countries on each band

WORLD TOP SINGLE OPERATOR, ALL BAND

Station	160	80	40	20	15	10
HC8A	90/10/17	302/23/52	953/28/82	1174/33/101	2677/35/128	3764/32/121
PTØF	26/13/27	235/19/50	779/26/89	2132/36/138	1647/33/130	3353/29/128
CN8WW	75/8/32	754/19/80	959/22/93	1659/34/109	1777/33/119	2478/27/111
EA8AH	102/12/44	601/26/80	656/22/83	1755/36/117	1559/36/118	3054/29/100
P4ØW	84/9/22	423/17/65	663/25/85	1593/35/117	1909/34/122	2619/33/124
ZD8Z	26/8/11	116/19/60	366/26/66	1402/34/110	1514/35/124	3566/35/132
SU2MT	64/7/24	433/14/63	592/19/70	1018/33/112	1489/32/110	2876/33/109
3V8BB	217/8/54	564/19/78	642/27/91	873/38/120	1531/34/130	1342/36/117
C4A	150/9/50	314/17/73	757/24/89	1138/32/99	1194/31/111	1552/33/126
EA9AM	119/8/37	441/19/63	436/21/66	807/25/87	1389/32/99	1882/27/107

USA TOP SINGLE OPERATOR, ALL BAND

Station	160	80	40	20	15	10
K1AR	27/9/19	258/17/80	295/28/84	870/39/137	1267/34/136	404/29/103
K5ZD/1	58/11/30	335/18/77	310/24/82	1051/35/116	1063/32/110	263/25/76
W4AN	36/13/22	167/17/62	347/29/91	697/35/116	1167/32/123	356/30/98
K3ZO	21/9/12	261/18/62	214/22/73	507/33/98	866/30/107	462/28/106
N2IC/Ø	35/11/20	110/23/49	444/27/66	404/34/109	819/32/110	524/28/82
W9RE	28/11/19	156/23/68	190/25/80	522/36/120	932/34/120	262/27/88
N2LT	19/6/9	105/14/47	114/23/61	609/34/109	1138/33/121	285/26/89
W3BGN	40/13/25	141/16/61	159/20/68	627/36/106	643/28/102	503/27/104
N3BB/5	18/6/13	47/16/28	401/24/59	172/30/85	1111/33/104	691/32/83
K2DM	21/6/13	215/18/66	122/22/67	617/31/97	730/26/105	315/25/77

WORLD MULTI-OPERATOR SINGLE TRANSMITTER

C56T	48/10/28	190/17/60	655/27/88	2716/37/148	1999/36/154	2995/35/153
9Y4NW	92/13/30	358/21/71	921/27/100	2704/35/124	2071/32/131	2471/28/130
FG5BG	122/10/23	460/18/72	585/22/74	2093/34/122	2458/33/127	2497/29/125
TM2Y	216/9/53	492/21/85	798/32/124	1258/37/150	1550/37/144	845/32/139
IR4T	133/11/61	474/23/92	1141/34/131	948/38/155	1898/38/158	457/34/151
EA8ZS	22/4/13	291/12/48	792/27/93	822/34/124	1702/31/121	1528/30/133

USA MULTI-OPERATOR SINGLE TRANSMITTER

KC1XX	47/13/44	514/24/100	396/30/114	1147/39/165	1216/33/162	309/30/141
N2NU	38/13/34	381/22/95	167/27/94	1037/40/159	1128/36/160	255/30/129
K4ISV	28/13/24	96/26/67	291/31/97	998/39/138	895/35/145	337/30/126
W9JA	33/15/26	76/22/56	209/30/98	679/40/148	1058/36/156	400/30/118
N4TO	32/12/26	197/20/76	149/28/92	558/38/131	791/36/145	744/31/137
K8AZ	31/11/25	111/22/69	163/28/94	847/39/145	951/35/144	334/30/135

WORLD MULTI-OPERATOR MULTI-TRANSMITTER

PJ9B	351/15/41	1062/27/101	2540/34/140	4725/39/185	5190/39/180	5460/35/176
EA9EA	190/10/48	1463/26/99	1608/32/116	3102/40/158	3491/39/153	2808/36/157
V26B	437/15/39	1155/27/101	1792/29/124	3579/38/167	3831/36/170	4315/34/151
P3A	360/9/57	1255/22/94	1992/34/126	2774/39/145	3647/40/159	3047/38/158
IH9P	632/10/68	1059/20/86	1575/33/115	2777/40/151	2487/36/134	2353/36/162
KH7R	152/10/11	911/28/61	1654/35/88	2818/39/141	4173/37/119	3763/36/104

USA MULTI-OPERATOR MULTI-TRANSMITTER

K3LR	143/17/42	884/27/102	838/36/128	1931/40/173	1881/39/174	975/33/142
N2RM	121/13/34	786/30/110	651/28/112	1669/40/169	2091/38/169	920/31/140
W3LPL	203/18/51	726/25/104	517/28/105	1691/40/161	1650/36/162	1162/32/150
W1FJ	100/13/46	685/24/98	389/27/98	1468/39/150	1421/34/141	578/30/124
W2A	27/9/14	502/22/94	333/30/99	1708/40/157	1482/35/156	651/30/135
K9NS	45/11/19	335/28/93	436/32/111	1073/40/157	1339/37/158	962/33/143

Jim, N3BB/5.

Hugo, XE1CRO, in his first contest.

anyone at the final bell. EA9EA finished second just ahead of a half dozen teams from all around the world. P3A broke the Asian record by almost 10 million points, and JA5BJC, from their beautiful mountain top QTH in central JA5, raised the JA record by 800,000 points. Continental leaders were EA9EA (AF), P3A (AS), M8T (EU), V26B (NA), KH7R (OC), and PJ9B (SA).

In the U.S., a remarkable win was posted by K3LR who beat out N2RM for top USA honors, with W3LPL a close third. Tim's crew can be proud of their outstanding effort. Look at their multiplier totals. Quite outstanding! The U.S. MM leader is usually from the far east coast, but Tim has proven that with the right conditions and crew it can happen further west.

Putting up with gale winds, the gang from M8T finished on top in Europe. This is quite an achievement for the FD-style M8T crew. Not far behind in second place was OT8A. What an effort they had with 76 operators! What a good way to bring many hams into contesting. Third place goes to the famous RW2F crew.

There was very strong representation from all over the world in the Multi-Multi class this year. The U.S., JA, and European winners didn't manage to crack the top ten. While South America seems to still be the place to be, with Africa coming very close at times. Four of the top ten operations were from North America and two operations from Oceania made the top ten this year. Congratulations to all the teams, who did so much work to build and man these multi-multi stations. These are the beacons that show us what the true potential of all the bands.

Team Contesting

You can have fun with the team category. Five members from around the

EUROPE TOP SINGLE OPERATOR, ALL BAND

Station	160	80	40	20	15	10
GIØKOW	197/9/51	738/19/82	547/22/95	1930/34/118	1425/35/113	431/24/80
OT8T	119/8/55	409/21/82	585/30/120	947/39/138	1125/35/139	293/30/136
4N9BW	233/8/53	411/15/71	771/31/108	924/36/138	1033/36/117	350/33/121
OK1RI	174/9/47	301/11/56	758/27/91	1114/33/106	1043/35/107	343/30/85
GW4BLE	84/6/36	271/11/48	353/21/62	962/31/100	1064/30/101	587/25/85
DL4NAC	125/8/41	227/12/60	542/28/94	831/32/123	930/31/123	263/31/109
OHØZ	54/5/28	559/15/66	636/25/92	1213/34/113	1005/33/116	424/26/85
DJ4PT	82/6/34	335/18/66	355/28/83	764/32/107	771/30/105	199/27/82
YT1AD	125/6/44	125/8/44	433/24/77	845/31/95	1079/30/99	193/24/78
F5NBX	51/5/24	278/14/55	283/23/65	566/26/80	1235/29/106	156/23/73

EUROPE MULTI-OPERATOR SINGLE TRANSMITTER

TM2Y	216/9/53	492/21/85	798/32/124	1258/37/150	1550/37/144	845/32/139
IR4T	133/11/61	474/23/92	1141/34/131	948/38/155	1898/38/158	457/34/151
HG1S	384/9/54	879/19/83	1151/34/129	1303/37/150	1766/37/149	479/32/132
TM1C	50/7/50	653/21/79	982/29/112	1588/37/126	1162/33/127	382/24/107
OK5W	46/7/46	389/18/79	1029/32/126	1245/39/148	1190/37/142	250/34/125
CU2V	163/7/23	415/11/33	519/14/48	1139/24/83	1710/27/91	2321/25/89

EUROPE MULTI-OPERATOR MULTI-TRANSMITTER

M8T	668/10/66	1289/26/101	1609/28/129	2737/39/176	1958/40/177	1057/31/155
OT8A	865/10/64	1398/20/87	2089/33/125	2559/38/166	2195/36/158	798/30/139
RW2F	693/11/64	1206/26/101	1531/37/130	2262/38/157	1397/37/155	771/30/129
OH2HE	646/10/63	838/23/96	1535/36/139	2043/40/166	1182/36/143	616/29/138
HG6Y	368/8/58	994/16/78	965/26/113	1886/38/148	2190/38/150	978/35/145
DLØCS	632/10/58	1029/22/89	1245/29/126	1354/37/151	1090/38/156	523/29/137

world or from rival clubs in the same country is all you need. Once again the number one team was Nieger's Tigers #1. This team set a new team contesting record of over 63 million points. That works out to be 12.6 Meg per team member! It was only 10 years ago that the single operator record was 12.7 million. Second place honors go the Contest Club Finland. Putting together Finns from all over the world, the CCF beat out Contesting.com, who finished very high with only one outside the country DXpedition. Congratulations to all the teams.

New All Time SSB Records

WORLD: AB HC8A (N6KT); 28 ZX5J (PP5JR); L21 OK1AUT/5NØ; A28 ZZ5G (PY5GU); **AFRICA:** AB CN8WW (DL6FBL); 28 5X1T (ON6TT); L28 9G1BJ; L21 OK1AUT/5NØ; MS C56T; **ASIA:** C4A (5B4ADA); 21 5B4AGC; 3.7 5B4/NP3D; L28 5B4/EW1AR; L14 RJ9J (RA9JR); L3.7 4L5O; QA JR4DAH; Q7 JA6GCE; MM P3A; JAPAN: QA JR4DAH; Q7 JA6GCE; Q3.7 JA1AA; MM JA5BJC; **EUROPE**: AB GIØKOW; **NORTH AMERICA:** AB L28 XE2DV; L21 V31MX; USA: A21 N3RD; **OCEANIA:** 21 9M8R(W7EJ); L14 FK8FI; **SOUTH AMERICA:** AB HC8A (N6KT); 28 ZX5J (PP5JR); LA HC1OT; L28 LRØH (LU9HS); L14 LU2NI; A28 ZZ5G (PY5GU)

Special Mention

The CQ WW brings out the best and 1998 was a banner year. The CQWW saw another major breakthrough when such goodies as B1A, China's first Multi-multi and B1Z (Multi-single) hit the airwaves from downtown Beijing. It was a definite BY fiesta, and B1A alone made some 9,000 QSOs, not only handing them out but also introducing the Chinese to the art of contesting during this historic weekend (see photo). The CQ WW congratulates B1A and B1Z and all the hams involved in bringing contesting to Chinese amateurs. There were several real great battles in the multi-single category, especially, in the Caribbean. Check out the results to see how close VP5DX, VP2V/K7AR,

Eli, PT7BZ, always a big signal.

WP2Z (left to right): N2WB, W4WX, W5OXA, W4CJK, AA9TK, VE3FU.

HI8/DK8YY, FM5BH, and WP2Z ended up. Wow! Now that is competition. Several single band efforts were outstanding from Africa. Topping the list was the score made by Akira, JAØJHA as 9J2A. He was certainly in the right place. Look at his score from southern Africa: top number of single band QSOs made by a single op. Over in west Africa, 9G1BJ set a new low power, 28 MHz record with an outstanding effort. Last year's IG team reprised their effort on single bands with two world highs and a second place. ZX5J operated by PP5JR was world high 28 MHz with 183 countries, tops for a single operator. In the all band category, Jose, CT1BOH, put his considerable talents behind the SU2MT callsign and gave practically everyone a double multiplier.

Comments

A. Rule Change: In the last few years, several operators have submitted several logs using the same callsign. Persons are now beginning to abuse the single callsign concept. For 1999, there is a new CQ WW rule which reads: "A different callsign must be used for each CQ WW entry."

B. Log Analysis: Ever since the UBN reports became available to the public in March of 1998, the CQ WW Contest Committee has been working hard to increase the depth of analysis and the ease with which we can understand reports. The crunching of log data and the effort to make the analysis as good

TOP SCORES

WORLD

HIGH POWER

All Band

HC8A.....17,055,106
PTØF.....16,519,026
CN8WW.....15,375,060
EA8AH.....15,277,596
P4ØW.....14,020,064
ZD8Z.....13,715,460
SU2MT 11,805,734
3V8BB 10,881,440
C4A.....9,781,930
EA9AM 8,749,164

28 MHz

ZX5J 3,322,230
5X1T.....2,501,521
LU6ETB.....2,368,128
6V1C.....1,623,378
CX8CP.....1,513,691
FK8HC.....1,505,160

21 MHz

9J2A 3,043,872
ZX9A.....2,597,688
TL5A.....2,211,366
9M8R.....1,944,800
9Y4VU 1,804,386
P43A.....1,783,821

14 MHz

8R1K.....1,719,836
CT3BX.....1,279,785
RZ9UA.....1,211,679
DJ7AA 1,074,159
GM8V 1,031,400
SN2B 1,016,784

7 MHz

IG9T.....973,782
9A5Y.....513,342
LZ3ZZ.....459,511
IK2NCJ/4 378,378
YT1BB 362,294
K7EM.....354,148

3.7 MHz

IG9T.....473,594
S5ØA.....357,846
5B4/NP3D.....250,416
9A6A.....235,807
K1FZ.....234,260
OK2RZ.....220,032

1.8 MHz

VE1BY.....148,798
IG9T.....113,022
LY3BS 93,610
S57M 50,040
YZ6A.....49,640
OZ3SK.....46,368

LOW POWER

All Band

HC1OT 5,660,880
XL7A.....3,513,342
YS1RR.....2,761,850
E31AA 2,589,816
J6/K3LP 2,221,698
EA8AG.....2,072,406
DL2NBU 2,049,057
LY63BA 1,707,480
T99W.....1,653,300
LU5VV 1,618,176

28 MHz

9G1BJ.....1,458,044
XE2DV.....1,052,625
LRØH.....1,026,564
P4ØN 959,728
LU3HIP 923,904
4X1VF.....904,639

21 MHz

OK1AUT/5NØ1,590,300
5X1Z.....1,084,671
CT3DZ.....866,392
TA3D 660,136
LU5HCI.....563,849
Z31GX 539,766

14 MHz

LU2NI 708,344
FK8FI.....630,605
LU3MDO.....623,840
DU3RCM 564,589
9A/WA4IMC....438,501
Z39Z 414,711

7 MHz

S57DX 177,642
YV5DZQ 114,048
CT1BWW.....103,736
T95A.....101,505
LU4DX.....90,896
S54A.....80,128

3.7 MHz

4L5O.....146,316
YM75TA.....88,200
SV2CWY 84,630
F2EE.....49,938
YU1CC 48,646
IK3SSJ.....47,888

1.8 MHz

HA8BE.....36,894
YU1RA.....14,250
EA1DVY 7,332
SP9RPW 6,168
EI7IU.....5,989
DL1KZA.....4,943

QRP

All Band

N6MU 612,264
YU1KN.....575,600
K2PS 524,901
LU1VK 518,169
NØKE.....499,280
JR4DAH.....419,482
EA1GT 304,792
LY2FE.....287,532
JA2DLM.....270,336
YU1LM.....269,325

ASSISTED

All Band

K1ZM.....5,168,493
TM2V.....4,670,048
DLØWW.....4,358,410
KI1G 4,335,610
KS1L.....4,088,666
K3WW 3,488,265
8P6SH 3,029,400
K3NZ 3,161,220
W1GD/2.....2,867,834
K1VR 2,861,712

MULTI-OPERATOR
SINGLE TRANSMITTER

C56T.....19,118,437
9Y4NW.....17,929,236
FG5BG 12,042,342
TM2Y.....10,381,027
IR4T.....10,063,075
EA8ZS 9,313,670

MULTI-OPERATOR
MULTI-TRANSMITTER

PJ9B.....53,994,248
EA9EA.....32,346,460
V26B.....30,539,106
P3A.....29,108,800
IH9P.....26,830,830
KH7R.....26,436,483

EUROPE

SINGLE OPERATOR
HIGH POWER

All Band

GIØKOW.....7,388,788
OT8T 6,791,449
4N9BW 5,240,144
OK1RI.....4,838,015
GW4BLE.....4,520,836
DL4NAC 4,395,584
OHØZ.....3,742,508
DJ4PT.....3,452,766
YT1AD.....3,023,440
F5NBX.....2,965,933

28 MHz

9HØA 892,515
CT4NH.....874,665
TM6P 584,355
4O6A 450,248
S53R.....446,200
CT1AHU 408,192

21 MHz

9A9A.....1,517,020
OE6Z 1,053,032
IY4W.....1,005,714
S5ØC 1,001,662
GM4FDM 907,144
S5ØU 842,800

14 MHz

DJ7AA 1,074,159
GM8V 1,031,400
SN2B 1,016,784
4N7B.....945,507
OHØMM.....843,081
S53M 771,876

7 MHz

9A5Y.....513,342
LZ3ZZ.....459,511
IK2NCJ/4 378,378
YT1BB 362,294
HG9X.....328,482
OM5M.....270,340

3.7 MHz

S5ØA.....357,846
9A6A.....235,807
OK2RZ.....220,032
SP7GIQ 147,599
S51OI 107,613
LY61FW.....90,436

1.8 MHz

LY3BS 93,610
S57M 50,040
YZ6A.....49,640
OZ3SK.....46,368
4O6A 43,524
SV8CS.....39,284

LOW POWER

All Band

DL2NBU 2,049,057
LY63BA 1,707,480
T99W.....1,653,300
9A2EU 1,457,708
DF7RX.....1,319,744
ON7RN.....1,309,902
S59AA 1,276,560
YU7AL 1,275,000
LY2BTA 1,150,515
DL1MGB.....1,096,959

28 MHz

EA7GTF.....400,652
EA7FTR.....391,820
CT1ELP.....370,194
CT1ESO 369,025
EA7HBP 364,287
ISØGYW 310,990

21 MHz

Z31GX.....539,766
UA4LCQ.....459,062
RU4PL.....387,855
EA7DBO.....336,812
YR9P 290,832
F5BMK.....256,452

14 MHz

9A/WA4IMC....438,501
Z39Z 414,711
Z31JA 378,184
ES2RJ 339,328
IQ7A 335,916
S58WW 258,366

7 MHz

S57DX 177,642
CT1BWW.....103,736
T95A.....101,505
S54A.....80,128
UT1T.....62,177
IR7S.....54,900

3.7 MHz

SV2CWY 84,630
F2EE.....49,938
YU1CC 48,646
IK3SSJ.....47,888
4N1A.....42,028
EC1CFD 41,676

1.8 MHz

HA8BE.....36,894
YU1RA.....14,250
EA1DVY 7,332
SP9RPW 6,168
EI7IU.....5,989
DL1KZA.....4,943

QRP

All Band

YU1KN.....575,600
EA1GT.....304,792
LY2FE.....287,532
YU1LM.....269,325
S59D.....253,270
HA7YS.....251,085
SM3CCT.....122,304
OK1DKS.....93,312
IK5RUN 85,100
IØKHP 70,020

ASSISTED

All Band

TM2V.....4,670,048
DLØWW.....4,358,410
OE8SKQ.....2,685,358
S57S.....2,547,000
DJ2YA 2,445,801
OL6X 2,271,368
OK2FD.....2,174,589
IO4A 2,103,696
DL1MFL.....1,881,124
IN3ZNR.....1,707,198

MULTI-OPERATOR
SINGLE TRANSMITTER

TM2Y.....10,381,027
IR4T.....10,063,075
HG1S.....8,234,800
TM1C.....7,456,080
OK5W.....6,670,332
CU2V.....6,346,475

MULTI-OPERATOR
MULTI-TRANSMITTER

M8T 16,183,028
OT8A 15,288,750
RW2F 11,212,410
OH2HE 10,157,670
HG6Y.....10,154,965
DLØCS.....7,914,186

USA

SINGLE OPERATOR
HIGH POWER

All Band

K1AR 5,952,375
K5ZD/1 5,481,048
W4AN 4,989,960
K3ZO 3,815,240
N2IC/Ø 3,777,672
W9RE 3,588,312
N2LT 3,572,140
W3BGN 3,401,478
N3BB/5 3,232,413
K2DM.....3,068,044

28 MHz

KZ5MM.....597,144
W6YA 420,930
W5OB.....404,379
W6NL.....389,838
N4BP 388,950
KØKE 304,569

21 MHz

WØUN.....720,954
NN4T 552,292
NØNR.....544,893
W4MR.....400,368
K6AW 400,040
WA2QNW.....339,200

14 MHz

W7WA 781,440
K4XS 705,272
K3CR.....543,904
W7IL 310,288
W4RRR 233,970
W8JGU.....189,497

7 MHz

K7EM.....354,148
KVØQ.....280,462
KZ2I/4.....74,732
K2WE 63,162
NC4NC 45,200
W7CB/6 32,508

3.7 MHz

K1FZ.....234,260
K4ZW.....188,500
KM2P.....150,150
KE1Y 130,005
K1LZ.....122,605
W6KW 102,717

1.8 MHz

W8LRL.....6,496
W2VO.....6,096
AA1BU.....4,042
N6RO.....2,314
AA4MM.....1,254
KØCS.....1,188

LOW POWER

All Band

WA1S 1,516,347
NA2U.....1,288,518
K1VUT.....1,241,934
KQ3V.....1,195,116
WA7BNM/7..1,097,250
K1VW 1,087,384
WS1A 1,012,440
WT1O 963,500
WW3S 910,610
N4DL 887,295

28 MHz

K7JA.....244,976
K6KAY.....185,334
K6RO.....174,832
KT3RR.....148,905
K2MFY.....144,560
KR5V 142,410

21 MHz

N4MO.....243,460
NY5B 173,088
KF8K.....168,635
N6WLX/8 158,485
K4SN 133,416
NW7Q/8.....132,616

14 MHz

K4PC 221,998
W7FP.....130,739
WD4CNZ.....55,800
K1EFI/3.....46,400
KG7RZ.....44,986
AF8C 27,552

7 MHz

W4UM.....31,770
WB2ZTH.....10,868
WG1Z 8,480
KQ6ES.....7,014
K4LDR.....2,660

3.7 MHz

WT3W.....9,196
W9LYN 2,871

QRP

All Band

N6MU 621,264
K2PS 524,901
NØKE.....499,280
W6YJ.....230,144
N1TM.....189,210
W8QZA/6.....149,580
NØFW 135,870
WA3KNO.....118,164
N4IJ 117,950
NQ7X.....70,680

ASSISTED

All Band

K1ZM.....5,168,493
KI1G 4,335,610
KS1L.....4,088,666
K3WW 3,488,265
K3NZ 3,161,220
W1GD/2.....2,867,834
K1VR 2,861,712
N3AD 2,758,920
K5KG/2.....2,714,067
W2RE 2,576,988

MULTI-OPERATOR
SINGLE TRANSMITTER

KC1XX.....8,728,040
N2NU 6,702,771
K4ISV 4,928,232
W9JA 4,879,400
N4TO 4,775,592
K8AZ 4,660,446

MULTI-OPERATOR
MULTI-TRANSMITTER

K3LR.....15,428,117
N2RM 14,680,668
W3LPL.....13,990,992
W1FJ 9,809,720
W2A.....9,391,460
K9NS 8,498,458

Visit Our Web Site

Vladimir, UX7MM.

as possible requires a lot of man hours. Hundreds and hundreds of hours are put into the UBN report before the entrant sees it. This year we have added the feature of marking QSOs which are removed from a log with a minus(-) sign. One of our prime directives, that all logs are treated exactly the same way, is fulfilled by the computer. Each log is rescored by a common .CTY file. The CQ WW .CTY file is updated each year after the contest to include any unusual callsigns or locations.

Access codes are sent out to every entrant who submits an e-mail log. If you sent a disk of your log, your personal UBN is available by sending an inquiry to **<question@cqww.com>.** If you sent a paper log only, no analysis of your log is easily available to you

You should review your UBN list to learn how to improve your contesting effort from year to year. If you are human, you make errors. Some do not like to admit this and consider themselves flawless. But you are not. You should seek to improve your skill. The guys/gals at the top are the first to thank the CQWWCC for providing a heretofore unobtainable insight into their logs. They try to improve and so should you. Just as in anything else, practice makes perfect. So what should you make of the report that you receive? In a rough sense you can view your **score retention** as a "grade." Just like when you were in school. So that 90-100 is an "A", 80-89 is a "B," etc. The strong words we have received from contesters everywhere are, "Thanks for this service. I can see how to improve." And that after all is the whole idea. To improve your skill.

C. Packet: Repeating this same paragraph from last year is warranted. The use of packet is perfectly OK for those who claim assisted or multi-operator. Any use of packet in any other category is wrong. If you are going to enter the HP, LP, or QRP categories you cannot receive any packet help. If you want to try to work some new DX countries, packet is an easy way to do it. Just claim assisted. A serious problem occurs when nine of the top scores in a category play by the rules and one decides to cheat. It is not fair or right that the entrant be entered into the same category as the others.

D. Log Submission: It is hard to believe that only a few years ago there were no e-mail submissions. Boy, how times have changed. Of the 3,540 SSB logs we received this year, 2,215 were electronic! Of those electronic, 1,750 were e-mail submissions! Wow! E-mail is the way to go when submitting your log and summary. It is easy and cheap. Please try it this year. **Send your CQ WW SSB log and summary to <ssb@cqww.com>**. You will receive a robotic response saying that your log was received by the CQWWCC. That will be followed in a while by a personalized access code so you can view your log and UBN report. Try it, you will like it. If you submit your log on a disk, please remember to name the files you send correctly. Do NOT give them names like 99ssb.sum for example. Name them with your callsign, e.g. HSØAC.sum. Please **send your CQ WW CW log and summary to <cw@cqww.com>**.

Many entrants send a paper log which is computer printout without sending a disk or e-mail log. If you use a computer to generate your log, you can create a file from the logging software that you can submit as an electronic log. Please take the time to send in an electronic log. If you do not know how to do it, ask a friend. Your log will help make the checking of all the CQ WW logs better and more accurately certify the winners.

Thanks

Thanks to the CQ WW log checkers who validated the winners and provided insight into many contesting topics. The 1999 crew includes: K1DG, K3UA, K3WW, K3ZO, K6NA, KR2Q, N2AA, N2NC, N3ED, N6ZZ, N9RV, W3ZZ, and W7EJ. Our DX advisors were very helpful in offering advice, providing information and sorting out potential problems: CT1BOH, DL6RAI, EA3DU, F6BEE, G3SXW, HSØ/G4UAV, I2UIY, JE1CKA, OH2KI, OH2MM, OK2FD, ON6TT, PY5EG, S50A, UA9BA, VE3EJ. The decoding log team consisted of N3RA, K3LR, W3ZZ, and N5NJ. Special advisors were N2AA, N8BJQ, WØUN, and K3ZO.

Once again a special thanks to Dick, N6AA, who again spent countless hours to make the CQ WW database the best in contesting. Dick received beta test input from Phil, N6ZZ. The CQ WW uses the software developed by Tree, N6TR, to create all scores and analyses. John, K2MM, created the entire WWW log entry information. His robot worked smoothly in acknowledging receipt of a log. Tack, JE1CKA, has maintained the non-log data on cqww.com. Translations of the rules into Spanish, Japanese, German, and French were done by EA3DU, JE1CKA, DL6RAI, and F6BEE. Larry, N6TW, put in hundreds of hours and he was invaluable in retrieving and processing data from e-mail submissions. Thanks to John, K1AR, for his advice and hard work to make the CQ WW so successful. What you see in the magazine required thousands of hours of work by many people. Thanks to Martti, OH2BH, for providing the information on B1A and B1Z.

Congratulations to all the winners! To participate and have FUN is what contesting is all about!

See You in the '99 CQ WW!

73, Bob, K3EST

DX QRM

Murphy strikes again. After 3 hours of contest I lost final stage of TS950S. It took me almost 5 hours to borrow TS930S from Emil, 9A9A. DX conditions were fair but not as good as they were the week before contest . . . ***9A2EU***. What a competition. This year SOAB Top Ten box scores might be over a hundred million points!. . . ***C4A (5B4ADA)***. My first ever SOAB in a CQWW. Glad to be able to make it after 7 years of university studies and other commitments. Great fun. Had 9 hours of sleep despite two alarm clocks. Many thanks to my old school station who hosted me! I will be back! . . . ***C4W (5B4WN)***. Line noise inhibited full-time operation. Next time better luck . . . ***CP6AA (OHØXX)***.

I was waiting long time to have again conditions to do a CQWW DX monoband on 10m! Unfortunatly, I couldn't stay all time I wanted (particularly on Sunday), but I enjoy every minute I was on, epecially the unexpected opening to the States on Saturday afternoon. It prevented me from having lunch, but it worth the sacrifice. It was the best opening I ever had: 600 QSOs in 6 hours. WOW! Great fun. I sure will be back next year! . . . ***CT1EAT.*** As always, I have fully enjoyed to run this contest. Propagation was less than ideal for the QRP work, but I could manage to get some successful contacts. I hope to be here again in the forecoming issues of this great contest. Thank you very much for your good work; please keep on it! . . . ***CT1ETT***.

Despite an agreement with a nearby record studio, they had to record for a few hours on Sunday afternoon at our best 15m U.S. time and we had to shut off our amplifiers . . . ***DF3CB***. We did not have too much luck for our first serious attempt as Multi/Single. Right at the beginning the two antenna tuners broke down, packet radio followed soon afterwards, and after 12 hours we lost one amp. Anyway, the real problem was just to come: A few hours later a *heavy* storm built up, and one after the other we lost all our antennas, so after 22 hours the contest was over . . . ***DF4SA***. It was my first SO contest I got above the magic 1M points. It was a great feeling to hear such good signals on 10m from every continent. Hope to improve for next year on 40m. Who spends for a 40m Yagi? Thanks for the evaluation. You are making a good job! Carry on! . . . ***DL1MGB***.

This contest is absolutely dedicated to newcomer Holgi, who helped me so much to get antennas working before and during the contest. Storms were so strong . . . ***DL4NAC***. Condx were lousy; the northern path was absolutly rotten, even with some aurora. Guess I was too much to the north. It's painful to hear the southern European stations working piles of W's, and you can only "search & pounce! . . . ***DL8OH***. Lucky to there (E3) for the contest. What a shame with 100 watts and a loop antenna. Even if the call adds a few dB, it's very hard to find a clear frequency where people can hear you. Still a lot fun and I hope some of you got a new country . . . ***E31AA (F2CW)***. Ten meter opening this year was the highlight of the contest for me . . . ***EI4DW***.

I missed the 1997 edition of CQWW SSB due the arrival of *the baby* in our family. I can't say anymore than that I would never have missed CQWW for anything else in the world. I'll just say that CQWW is now just coming after my wife and my daughter . . . ***F6HLC***.

Some trouble with the 40m Yagi and the mult station. Nevertheless a lot of fun. See you next year, gentlemen . . . ***FM5BH***. Very much enjoyed the contest again. Unfortunately, not able to take part until late on Saturday and then most of Sunday . . . ***GØMRH***. Had a big flood at the club station—2.5 feet of water—so intended MS effort was QRT this year! But managed to get on for a few hours and got lots of new band countries . . . ***GØMTN***. Gale-force winds nearly blew over my antenna which started up at 90 feet. On Saturday afternoon it had to be lowered to 25 feet and tied down safely . . . ***G4AXX***.

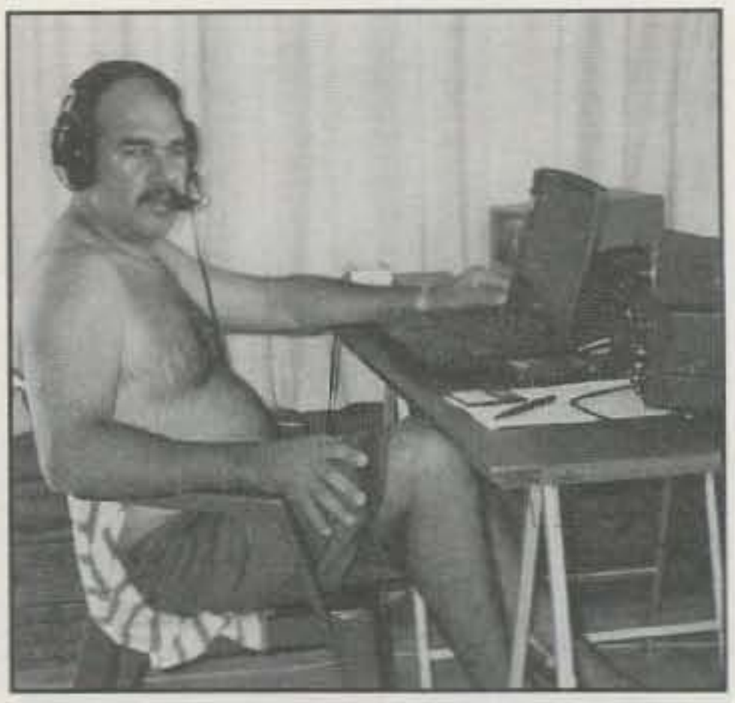
Lost main antennas in severe wx condx (70+ mph winds). Continued on makeshift dipole at 40 feet . . . ***G4WPD***. Lost 40m Yagi after first 12 hours; hurt the score. Anyway, it wouldn't be a contest if something didn't break! . . . ***GIØKOW***. Conditions were great. Picked up a lot of new countries and I was amazed when I managed to work ten stations on 160m, my first time on top band . . . ***GM3UTQ***. Severe storm hit UK during contest. South Wales was worst affected area with floods and strong gales. Had to wind my crank-up tower down to just 30 feet on Saturday evening and it stayed like that 'til end of contest! Was *not* conducive to big score! . . . ***GW4BLE***. With this year's special call we tried to give more stations a chance to work us on all band. Our next goal is to join the 40 years activity in the CQWW contest. Tnx to everyone . . . ***HB5H***.

Very difficult with only one vertical antenna and long wire. I will try to put better antennas for the CW part . . . ***HB9ARF***. This was my very first contest from my new QTH. Thanks for the XYL allowed me to do; thanks for the new callsign from my PTT, made everything easier . . . ***HA5JI***. Back in the WW after too many years . . . ***I2WIJ***. Exciting multinational team's experience: a nice group of operators, most looking for their first time in a real M/M effort, some simple but effective home-made antennas and accessories, a beautiful island, a lot of fun. See you next year from India Hotel 9 Pantelleria! . . . ***IH9P***. I lost first night due to a wedding going on Saturday morning, so I couldn't drive from Milan to Bologna till its end. I had fun anyway. Condition poor with W6 and W7 on 40 from CA, worked only W6EEN but good with Pacific area. KH7R was S9 on Saturday morning. I lost VK's from zone 29 that normally it's an easy QSO . . . ***IK2NVJ/4 (IQ4A)***.

First time in CQWW; nice experience. Good propagation in 10 meters. For our working conditions a nice score . . . ***IQ9A***. For the first I (IK1GPG) have activated a small MS station with my wife Betty (IK1QFM). Fantastic experience . . . ***IR1A***. I, JA1XRH, participated in this CQWW contest for the first time. I will try to do next CQWW again . . . ***JA1XRH***. It was very good propagation on 15m so that I could contact many stations including several Caribs . . . ***JA9SCB/1***. Prpagation was not good, but I could enjoy the contest. 400 QSOs would be good enough for 50 watts . . . ***JF3PLF/3***. Thank you for picking up my weak signal . . . ***JK1ATT***. I enjoyed first over 100,000 points, and I got 9J, Z28, 3DA5, IG9 African station. Especially 10m band was very good. I feel to start of "The 23th cycle" . . . ***JR1SGU***.

Low power is fine. Good cndx 10m on Sunday. Lost KH6 and FK8 on 10m . . . ***LY2BTA***. My plan was over 4M points. Wasn't good conditions to JA and USA. Ten meters was fine with many rare DX. Nine new ones! Waiting now for CW part my favorite mode . . . ***LY5W (LY1DR)***. High winds in England made Saturday night an exciting experience. All our towers are temporary and a 3-ele 40m beam on a crank-up tower in 70 mph winds is quite a sight. Amazing that the only damage was to one element! Still we'll be back next time, hopefully in calmer wx and better condx. ood luck with all the scoring . . . ***M8P***. First day not so good. Second day was better especially on 10, but Murphy was here on the second day morning. A very heavy windstorm demaged all my wire ants. Must repair some wires to work on the low freqs! . . . ***OE2S (OE2GEN)***.

XYL loved the contest. Plenty of time left to enjoy the weekend. Poor opening to JA on Saturday, great openings to W. Lots of activity! GREAT FUN! . . . ***OE6Z (OE6MBG)***. This year had even poorer band conditions than the last year. Well, new internet/DXCluster techology helped us to grow mult total by almost 100! . . . ***OH1AF***. Our 160m operator almost swallowed his tongue when, out of the blue, he suddenly heard a loud B1A on 1830 kHz, and immediately thereafter an even louder V8A calling B1A, and only a second after that, AH2R also calling B1A. Disappointingly, all managed to disappear quickly so he wasn't able to call them but once with no luck. The time was about 1515Z, some 20 minutes past our sunrise. A humble plea to the Far Eastern stations: There is a *very* good chance for a QSO with Finland on 80 and 160 meters around 1350Z! Anyway, the CQWW 1998 SSB was great fun again, and we certainly hope to hear you all joining us in the "Paksalo Polka" during CQWW CW, too! . . . ***OH2HE (now OH2U)***.



Alain, FK8FI (left), and Eric, FK8GM, put FK on the map.

The propagation was so poor that I had to search & pounce most of the contest. When I saw the WWV figures of Friday, I mentally oriented to a different approach on this one and had a lot of fun. At least the multiplier total is satisfactory. See ya next year . . . ***OH6NIO***. As usual I had great fun. Lot of multipliers come on CQ. See U next year with better antenna and hope better CONDX . . . ***OM7M (OM5RW)***. Broke my personal best records . . . ***OL6X (OK1DIG)***. Fabulous contest, great conditions. Congratulations to the winners. Local thunderstorms first day worst in years. . . ***P40W (W2GD)***. Talk about local RF leaving Aruba—many stations asked how many of "us" were down here . . . ***P43A***. A tremendous gale forced us to keep the crank-up towers in a low positon. If we had extended them to their full height we wouldn't have had any tower left after the storm (and the contest) was over . . . ***PA3DWD***.

We had to combine 10 and 160 meters. During this weekend we had a big storm (windforce 10-11). For approximately 10 hours it wasn't possible to turn the beams. This cost a lot of QSOs and multipliers. An AM broadcast station on 828 kHz with 20 KW only 1 km away from us give us so many receiving problems on 160m that it is impossible to hear weaker signals. We missed a lot of stations by this QRM, sri guys. We are working on getting better reception . . . ***PI4COM***. Thanks, K3LR, the only one from USA on 40 meters, just under ZP station. Many surprises from everywhere, very nice score. Best QSO number with my R7 . . . ***PY2NY***. It was just plain fun! I didn't do it for years, and could hardly imagine that we will be able to make over 1000 QSOs . . . ***RA3AA***.

Worked 160m VE1BY, 80m V26B, 80m VP2E, 40m AL7O, SU2MT on 6 bands, AH2R and CN8WW on 5 bands, and many others DX. We have also all bands 151 DXCC countries QSOs during the contest. Glad to see you in next test . . . ***RN4W***. Unfortunately, I do not have great anntennas for 160/80/40, but I do my best! It was *great fun!* . . . ***RV6LFE***. First time with 3-el Yagi (on 80m). My good old dipole is retired . . . ***S50A***. No more wins with 3-element tribander from the city. Next year must run from remote location with much bigger antenna. Another new one—Eritrea!. . . ***SP5DDJ***. This contest was second time experience in Central America, and we are very happy with good antenna, equipment, etc., and good friend Keko, TI5KD. MNY TNX! . . . ***TI5WFM***.

Had lot of fun. The propagation was good, mainly in 10 meters. It was a pity that our 80m antenna didn't work. See you next year from? . . . ***TO8B***. Condx on 160 seem to avoid me; another year of rough going to Europe. Tried to be extremely careful while logging. No more UBNs? . . . ***VE1BY (K3BU)***. Our first trip to Sept-Iles Quebec (Zone 2). It's a long drive but worth the trip. Nice setup there and Jean Claude (VE2XY) Rodrigue (VE2NN), and Frederick (VA2FFG) were very helpful. Propagation sure is different than it is in "1-land" and we needed to learn a few tricks. There were a couple of nice openings on almost every band, although northern Europe was missed. Lots to think about and plan for next year . . . ***VE2CSI***.

Murphy struck with RF in the shack when on 40 and 80 meters, but we had fun doing the contest, even with repairs made in progress . . . ***VE3DC***. The auroral event was pretty noticeable here with only SM2EKM being far enough north to sneak under the curtain. The rest of Scandinavia had to wait for the next day, as did the Russians except for a RN6 who was far enough south to skirt the problem. It was interesting to operate in parallel with the VE3EJ (MM) who is within line of site across Lake Ontario. Came close enough to their 15M score to feel I had done well. Lali, VA3RU, did very well as the main 15m operator! . . . ***VE3KZ***. Great to see the 10m band back in all its glory! I missed several countries and zones because the pile-ups were just humongous . . . ***VE3SRE***.

Glad to see the bands alive again. 10m and 15m were "meat and potato" bands for me. Some sleep and an Aerosmith concert on Saturday night kept me from having an even bigger total score! . . . ***VE3STT***. The bands were great on Friday evening up to Saturday evening. We focused on 10 and 15 meters during the early part of the contest, having been deprived of working these frequencies in the past years. It was great having those runs of JA's again. (Now if we could only talk faster) . . . ***VE6FI***. Lots of activity on the bands. Had lots of fun for my first CQWW test. Hope to be back for more . . . ***VO1WET***. We had many hours of high rates. This was a fun trip . . . ***VO2WL***. Equipment description: 6 bottles Malibu rum, 5 cases Heinekens, 1 case rum, 10 cases soda, 2 radios, 2 amps, 7 antennas . . . ***VP5DX***.

Missed too many multiplers because when the band is open to Asia, everybody runs JA and rarely, if ever, listens for weak non-JAs . . . ***VR98BG***. My first contest. I'm 18 years old and it was great! See you next year . . . ***XE1EZM***. The threat of a typhoon forced us to take down some of our antennas with 14 hours remaining in the test . . . ***XX9X***. It was nice to operate from 1700 meters a.s.l. in the mountains near the city of Stip. Good conditions to USA/JA both days . . . ***Z31GX***. Very strange conditions, especially to the US. There was a period when the conditions were changing so fast between North America and South America. In any case I enjoyed . . . ***Z31JA***. Murphy 1, Chris 0. Hardware problems, family problems, and thunderstorms sank my All Band plans . . . ***ZS6EZ***.

USA QRM

My second contest. I'm hooked! . . . ***AD6EN***. Wow! Nice to almost work DXCC on 10m in one contest! First contest with Classic 33 tribander at 70 ft. . . . ***AJ4Y***. This is my first entry, although I've operated in CQWW for years now. Hope to make a better showing next year when I get the tower up. Using only verticals can be a real handicap in those pile-ups. But it can still be real fun too! . . . ***KØIL***. I'm always amazed at propagation. Fighting to be heard in 20 meter pile-ups to Zones 6/7/8/9 and then working the JA's and ZL's easily with 30 dB weaker signals . . . ***K1TH***. First time ever on 10m during a contest opening. Need I say more! . . . ***K2CS***. New beam first try, 40 and 80 not working. Fun, fun anyway . . . ***K2FR***. This is my first time in CQWW SSB. Put in 3.5 hours, had a blast. Hope next time I can spend more time at it . . . ***K2ZQ***.

For many countries, it was the first time that I had ever heard the callsigns, let alone worked them in my 31 yrs of being a ham! Thanks to Dr. Jim Breakall, WA3FET, for this wonderful opportunity . . . ***K3CR (WA3HAE)***. We had a great time! Condx not what we hoped for, but better than last year. New 40m antenna worked well. See you next time . . . ***K5MR***. My first time; lots of fun; I'll be back next year. Got to try new elevated vertical on 40, good test . . . ***K5OE***. I had a wonderful time! It was awesome having 10m and 15m so productive! The biggest surprise had to be working ZD8Z on 10m, with his signal (as always) sounding like he was in the neighborhood . . . ***K6GT***.

First offical (serious) entry into CQWW. Had a ball. Ran single band, single op, non-assist, high power on 10m figuring no one else in this area (northern CA) would with the East Coast competition. Ten meters was booming to JA Friday night/Saturday morning. . . T2x rotator kept sticking Saturday at 70 ft. Had to rock it back/forth to get it loose! What a blast! Serious fun! . . . ***K6JOX***. I wanted to break the 6-land low power 10 meter record, which I did, but two or three other guys broke it bigger . . . ***K6LA***. Great 10m conditions on Friday and Saturday . . . very poor into Europe from the northwest. Sure was tough listening to everyone else in the country working Europe. Japan saved us once again! . . . ***K7CAR***. Hey East Coast: Share the Europeans with us, please! . . . ***K7JA***.

First time I worked this contest. Won't be the last . . . ***KBØPPA***. Had a blast until the end, when a real blast occurred. A resistor in the 3K-A amplifier fried and arc'd over to 4 kv, POW! Operated low power after 452 contacts. Fixed the amp the next day . . . ***KC3TL***. This is the first time I have entered this contest. It was a great contest for me on 10 meters, as I was able to put more countries for DXCC on that band. 20 meters was also hopping, and gave me a couple more new ones. I look forward to next year when I can hopefully do much better . . . ***KC8HWV***. The first big contest I've been in. I not only had a great time, but I heard calls in my sleep for two nights afterward. I may be hooked! . . . ***KF4ZTJ***. I never intended to submit a log. I never solicited contacts but these were made "giving out points." Before I new it, I had spent at least 15 hours trying to find stations not yet worked and also demonstrating to non-hams what the contest was about. Maybe at least I can represent the "9" call area to some small degree . . . ***KF9WM***.

Spent Saturday night showing some non-hams what contesting was about. They liked it so much that they were back at 6:00 AM the next morning and stayed the whole day . . . ***KF9YT***. This was my first serious effort on 10 meters and it was exciting. I found the operators were extremely well-mannered, based on my ability to hold a frequency and control of the pile-ups. Wish I had better propagation for access to more multipliers. Also, this was my first contest with CT contest software and it was fantastic. Thank you, *CQ*, for bringing us these contests . . . ***KH6T***. New strategy increased our score 80% from the previous year resulting in a new Zone 31 record. Too bad we didn't have a decent EU opening! . . . ***KH7R***.

I have been at the new QTH for 5 months now. Things seem to be falling into place nicely. My highest antenna is at 64 ft. as of now, but hope to change that by spring. Guess it helps being atop a hill with no civilization toward Europe for a few miles. Conditions on 10 were much better the first day; congrats to 5X1T for an outstanding 10 meter score (4200+ Q's 37 Z and 171 countries) wait until the band is awake for both days . . . ***KI1G***. Tried to concentrate on 10m. Band was dead enough when contest started; made a few Qs on 15 and 20 just to be sure the rig was working. Learned a little about 10m. Been a while since I operated this band . . . ***KJ9C***.

The contest started with me taking the day off and the condx in the toilet. Screamed and yelled all night long for a few Q's. Had a chat with Rich, KL7RA, on 40, and found he was not having too much luck either. And then—what a difference a few hours make. Had a great time on 15 and 10 the next day, and worked into EU the second evening. I think I scared a few Cyprus stations, as they were all I heard on 10 over the pole. Happy with the results. Wish I could have broken a million . . . ***KL7AC***. Better condx this year, but looks like I picked the wrong bands to be on. Oh, well, at least the two 4-squares worked better; tnx for publishing low-power breakdowns in *CQ Contest*. Wish I had gotten them before the test . . . ***KQ3V***.

My best ever score in CQWW. Ten meters was wonderful to have back again! Still not able to run with the big dogs on 20, but still a lot of fun . . . ***N2QT/4***. Only have wire antennas and the 40m full-wave broke some time on Saturday. No wonder I couldn't work anybody on that one! Next year I'll have a tower and tribander with the wires—watch out! . . . ***N4CW***. My second year, and love this contest . . . ***N3YEA***. Best behaved participants yet. If I could only inform the US hams not to call unless they are in the contest. I was told how slow the traffic was on road 128, was asked to check a fellow's audio and signal both upper and lower, and it goes on. It really frustrates me, what to do . . . ***N4KW***. This was a rebuilding year with little to show for a year's work on the tower. Very tough conditions for the current configuration. This was a first year with packet running to the rig. Result: too much DXing and too little running. Hope to do better next time . . . ***N4RV***.

Best conditions in years. We all had a great time and will be back again next year to improve our results. This year's score was 60% better than last year; conditions were major difference . . . ***N4TO***. Great contest. Beat last year by 100k. My second WW SSB and first time to hear 10m *open*. Tnx all the Q's . . . ***N5KB***. Took this opportunity to set up two stations and let some new operators get their feet wet in the the world of contesting. It was enjoyable for myself (NX5M) and N5XJ to have time to teach some technique. The ribs that N5XJ made were really good . . . ***N5YV***. I'm in an antenna restricted area. My antennas are intended to be invisible from the street or neighbors, unfortunately not silent. I just hung the longwire and homebrewed the Yagi. The longwire set off the burglar alarm at 3:30 AM and the Yagi started swinging in the breeze and pointed itself right at the TV in the neighbor's family room. Spent a lot of time talking and re-thinking antennas . . . ***N6AFI***.

My all-time personal best, even with a break for soccer games on Saturday. I guess a new antenna and a more active solar cycle helps . . . ***N7UJJ***. Great conditions on both 10 and 160 meters! A great time operating . . . ***N7KQ***. Have done CQWW Phone since 1984 as WB6FCR/KH6 and WR6R/KH6. Sure nice to do it with a shorter call. Score this year about the same as last year, but it was more fun because Murphy did not happen. Next year will really be fun because I may finally get commercial power! . . . ***NH7A***. It sure was fun. Our score was 250% of last year's. The bands are coming back . . . ***NK7U***. Thank you JA! . . . ***WØUN (WØUA)***. Lotsa fun, even with wires . . . ***W1UK***. We operated Multi-Op here at what is most definitely a small single op setup, but we enjoyed the contest and did as well as we expected. What do you do when 10, 15, and 20 are all open and you have a tribander. We used the 40 meter beam on 15, and then on 10 meters, to pick up a few great multipliers . . . ***W1WFZ***.

First-ever entry in CQWW, Drake C line, L4B, Cushcraft R-7 at 10 ft. All S&P . . . ***W4ASM***. Our second run at this game. Went much smoother than last year but we didn't attempt QRO on the second station. Lots of improvements and nearly doubled our score from last year. The training for NU4JJ and WD4K was valuable experience and I look for great things out of them in the future! It is most humbling to operate the second station with 100 watts and a wire antenna after running the "Big" station with aluminum and a KW! Look for us next year! . . . ***W4CAT***. Our best effort in our 8-year history. Great openings to Oceania, and 40 meters seemed to be our hottest band for new mults. Worked DXCC on two bands, another first here. Still have to find a way to hold a freq. for big 20 and 15 meter runs. Our main amplifier went QRT on Sunday morning at 1100Z, but quick surgery brought it back after being down over an hour. Nice try, Murphy, but not this year. We doubled our score from 1997! . . . ***W4NC***.

I think this is the first time in 6 years that I cannot complain about the weather! It was a beautiful weekend. Sure was good to hear 10 and 15 meters opening again. However, 80 and 160 never did open in my area . . . ***W5CWQ***. Ten meters was great! Happy propagation is here . . . ***W7BJB***. First time on the air on HF since around 1969! Despite low score, had a great time . . . ***WA2BHJ***. This was my all-time best score for any contest! The band conditions were definitely better than they've been since at least 1992. My only regret (a very small one) was that I didn't make DXCC for this contest (93 unique countries) . . . ***WA2CNV***. Nice to see 10m very alive again for this event. Solar Cycle 23 was a bit "too good" on Sunday afternoon giving 50 MHz paths to Ecuador! . . . ***WA5IYX***.

Glad to see bands opening again. Had a good time working a few new ones. Thanks to ops who pulled through the QRP stations . . . ***WA5OJI***. Best score ever for me. First time over 1000 QSOs and first time over million points . . . ***WA7BNM/6***. This was my biggest effort ever. I spent 24.5 hours on the bands and for the first time made some 80 and 40 meter contest QSOs. Working low power unassisted with an attic antenna was tough, but I was able to work some new DX countries to add to my DXCC totals. Next year I will have some kind of outdoor antenna. My congratulations to those DX ops who were able to pull me out of the mud . . . ***WF2B***.

It was a blast to travel around the world in a weekend and never leave the comfort of my home-sweet-home. Viva Team Tennessee and Tennessee Contest Group! . . . ***WO4O***. Competition seems to be increasing in the SOLPAB category. It's not enough to simply show up anymore. With all the talent I heard on the bands this weekend, it's getting to be a real low-power slugfest. Wait until next year! . . . ***WS1A***.

Station Operators
Multi-Op Single Transmitter

3E1DX: HP1XVH, DL5RBW, DL1RBR, DL9RCF. **4N7Z:** 4N7TA, YT7XT, Ivan, Anrej, 4N7NN, Stan. **4U1ITU:** OM1AM, OM2RA, OM3BH, OM3LU, OM3RM. **4U1VIC:** DH3IAJ, DL1IAN, DL5IO, DL5IST, K7AWD. **9A2L:** 9A2VJ, 9A3AG, 9A4KD, 9A3DF, Varga, 9A4NP. **9A5D:** 9A3NY, 9A4NC, 9A4DU, 9A5DU, 9A6KEB, 9A6KCO. **9A7A:** 9A4RX, 9A3TR, 9A6DM, 9A4BT, 9A8A, 9A7V, 9A2ME, 9A3OS, 9A4PA. **9A7P:** 9A6NHH, 9A5AEI, 9A3RE, 9A6NPM. **9A9D:** 9A4KK, 9A4WW, 9A4DD, 9A4UU, 9A5YA. **9H3WD:** OK1AD, OK1AYU. **9V1YC &** 9V1BH. **9Y4NW:** DK6WL, DL4MCF, DL4MDO, DL4MEH. **A45ZN &** GØMRF, GØPZA. **AA5NT &** N5NJ. **AA8U &** K8MJZ, W8MJ, N8NX, KF8QE, KT8X, ND5S, W8EB, K8KS. **AB2DE:** KC2AUE, N2KPB, KB2YJT, KB2IZB. **AE2F &** WR2I. **AF6P:** WA6LOS, W1LLY, KO6GX, N6VVY, KC6JYQ, KE6IKY, KD6JIE, KC6JYJ, N6WWO, KD6IWA, N6WJN, KC6KPA, KD6VIV, KE6EJK, KE6IKN, KE6KTF, KD6DCG.

AY6D: LU2EU, LU3DW, LW4DX, LW5DX, LW6ETR, LW7DX, LW8DJZ. **B4R:** BA4RC/Chen, BD4RX/Dragon, BD4RF/Dave, BD4RD/Ken, BD4RE/Yee, BY5QN/Chen, BG4REK/Kun. **BY2HIT:** Leao, Huang, Chen. Li, P. Zhang, A. Zhang, Cai. Beedlow. **BY2JCY:** Li Mingshou, Jiang Ximing, Zhang Xinghong, Yan Yi, Yuan Guangpeng, Song Peng, Zhang Yang, Zhang Xin, Shang Rao, Li Chung Shzng, Zhang Jiz. **C56T:** DL5NAM, DF4RD, OE2VEL, DL8UD, OE2MON, DL9NDS. **C6A/KI6T:** KI6T, WR6O, KA6WHA. **CE3F:** SM3SGP, CE3FIP. **CO2BCC:** Winston, Bob. **CQ9K:** CT3BD, CT3BM, CT3CD, CT3DL, CT3FH, CT3HF, CT3HK, CT3IA, CT3KN. **CS1A:** CT1DXQ, CT1FAC, CT2FUN, CT2GDF, CT2FVL. **CU2V:** DL4XS, DL3KDV. **CX1JK &** CX1JJ. **DFØAT:** DF6QV, DL9NC. **DFØHQ:** DL1AUZ, DL2OBF, DL3TD, DL4ALB, DL4MM, DL5ANT, DL5AXX, DL7VOA.

DFØHTE: DF7ATW, DH4SBO, DK1SAM, DL1SFK, DL3SBI, DL5NAH. **DF3CB &** DK2GZ, DL1ZIH, DL3NED, DL5MFF. **DF4SA &** DK8TU. **DHØDX:** DF8XC, DF8AE, DK5QN, DL1YDI, DL8YFC, DL1YAW. **DKØPI:** DL3LBA, DF3GA, DL7AOS. **DK4QT &** DK1QH, DL1YFF, DJ7YP, DL9YED. **DK6QW:** DL3QQ, DF8QJ, DL6YFB. **DLØAO:** DL6RDE, DJ5RE, DJ6RN, DK1RP. **DLØTS:** Club. **DL2DBH &** DJ9DZ. **DL9LR &** Others. **DN1MA:** DL7MAE, Robert, Markus. **DX1ØØDX:** WJ1P, DU1SAN, 4F2KWT, DU1MHX, DU1JXP, DU1KBE, N9BXH, N6JFO, DU1NQP, AC6CP, DY1SNL, DY1KXR, DY1LVA. **DX1E:** DY1FDD, DU1KQG, DY1KXF, DY1FYU, DY1RAN, DU1RSM, DY1FLE, 4F1RGD, 4F1EJD. **EA1COZ &** EA1EAG. **EA1EEY &** EA1CS, EA1DZW, EA1CUB, EA1BXW, EA1BVP. **EA1FEL &** EA1BFZ, EA1ACP. **EA3RKG:** EA3BOW, EA3BOX, EA3DGQ, EA3EIO. **EA4ML &** EA4CT, EA4ET, EA4TX, EA5GRC, EA7JB, EA7WA, EA4KA, EB4EPJ, EB4AKI. **EA4RKU:** Club.

EA4ST & EA4ATI. **EA4TD &** EC4AEW. **EA5BY &** EA5BXT, EA5EU, EA5FID, EA5GRV, EA5IK, EA5KW. **EA5FKX &** EA5DWS. **EA5URP:** EA5ON, EA5DFV, EC5CPL. **EA5YJ &** EA5CMQ. **EA8NL &** EA8BVH, EA8AKN, EA8BHS, EA8BIK, EA8BVX, EA8CAJ, EC8ABT, EC8APU. **EA8ZS &** EA8KK, EA8PP, EA8BYL, EA8AM, EA8BTA, EA3ELM, EA2KL. **ED1BD:** EA1BD, EA1ALD. **ED1US:** EA1US, EA1DAX. **ED2BB:** EA2ANG, EA2CRG. **ED2RC:** EA2CBY, EA2BFM, EC2AFA, EA2ARW, EA2ABM. **ED2WW:** EA2MQ, EA2ATU, EA2CCG, EA2CNB. **ED3PX:** EA3BHB, EA3JG, EA3AR. **EK8WV:** Petrosian, Ratevosian. **ES5Q:** ES5MC, ES5MG, ES5QX, ES5RN, ES5RW, ES5RY. **F8KCF:** F6BNH, F6BGC, F5UAM, FB1CMF, F5AVK, F4BGO, F1ADG, F6FNL, F5OWB, F4CFR. **FG5BG:** N6RV, W6SR, N6ED, K6RO, W6KK, N6RT. **FM5BH &** FM5BH, FM5DN, FM5DP, FM5DS, FM5FJ.

G8B: G4LØØ, G3OZY, G4VXT, M1ACI, G4YRF, G8ATD, MØBIK, G1GSN, G4OXD, G3EUS, G8FFM, G4LWA, GØBVW, G8BEG, MØAJF, G4OXD. **G8Q:** GODYW, GØMKN, GØDSH, GØSAH, GØUYN, GØWAT, G1LLW, G1GUK, G8LCO, G6PWS, GØVSA, G3ZVW, G4KZD, MØBOX, G3RWL, G4WSL, G3ZZY, GØMIC, M1CYT. **G8Y:** MØAYQ, G4IUF, G7LXK, GØLPX, G4KCT. **GM3USL/P:** MMØBRG, MMØBQM, MMØBQN, GMØDEQ. **HA3KNA:** HA3NS, HA3NU, HA3FTA, HA3OU, HA3OV. **HB5H:** HB9CIP, HB9BLQ, HB9CAT, HB9CXZ, HB9FBG, HB9FAP, HB9FBD, HB9SUL. **HB5OK:** HB9FAQ, HB9FBM, HB9PUE, HB9FBS, HB9DOA, HB9SUL, HB9FBL, HB9OAB. **HB5RL:** HB9AUS, HB9BYT, HB9FAW, HB9FBO, HB9OCR, HB9SFD, HB9YC, HB9ODK, HE9EEX, HE9ZHA, Emanuele, Damiano, Silvano. **HB9AJM &** HB9AGC, HB9AIB, HB9ALM, HB9APU. **HG1S:** HA1TJ, HA1DAE, HA1DAC.

HI3/ON4ANT & ON4GG, ON4AME, ON5LW, ON4CBA, ON4AWK, ON4AMM (YL). **HI8/DK8YY &** DL1JDK, DL3ALI, DL4JAN, DL4JS. **HSØAC:** HS1CKC, HSØGBI, E21EIC, HS1BZY, HSØVGC, HS6NDK, HS6MYW. **HZ1AB:** K3NA, GWØRHC, G3UPT, G7SLP. **IK4QJM &** IZ4COW. **IO2A:** IK2RZP, IK2HKT, IK2CIO, IK2XRW, IK2XRS, I2IFT, IK2AHB, IK2YYS. **IO2L:** I2OKW, IZ2ACZ, IW2HAJ, IK2YYE. **IQ9A:** IT9AJP, IT9CML, IT9INO. **IR1A:** IK1GPG, IK1QFM. **IR3P:** IV3TDM, IV3JVJ, IV3BKC, IV3BTY, IV3NTA, IV3WPR, IV3FAS, IV3NVB, IV3NUR, IV3BSU, IV3WWF, IV3WZG. **IR4T:** I4UFH, I4YSS, I4JMY, IK4IEE, IK4MHB, IK4UPB, IK4MTF, IK2SGC, IK2QEI. **IR9T:** IT9GSF, IT9STG. **IU2C:** IK2ULH, IK2JEF, IZ2AHF, IK2WQK. **IV3RAV:** IV3HYD, IV3WQF, IV3GHY, IV3HJF, IV3RCH. **IZ3ALM &** IZ3ALS, IK3TXZ, IK3OGI, IW3FQM, IW3HUG, IZ3ALO.

JAØYAK: 7M2UKR, 7M4AEI, JG7JMO, JI7OED, JI7TOR, JL7UPJ, JM7SGO, JFØESV, JGØEMU, JIØTAG, JIØWBO, JHØNVX, JHØSQJ, JHØUSD, JHØVYG, JRØDVM, Kanke, Hasegawa. **JA1ELY &** JA1LZR, JA1QGT. **JA1YGX:** 7L4WEZ, JO2FWB. **JA2YKA:** JL7JRO, Y.Niwa, JN2FMH. **JA6ZLI:** JG6POJ, JL6ELU, JJ6WYS. **JA9YAA:** JH9KVF, JG2KKG, JI2QKJ, JN2QCV, JM2FCJ, JEØAOV, 7L2OEG, JR9KZR, JJØDYQ. **JA9YBA:** Nada, JR9QNJ, JFØEGG, Sugimoto. **JE6ZIH:** JR6GKT, JA6SHL, JF6DEA, JI6BRB, JL6MPR, JM6CIP, JP6EGZ, M.Miura. **JF2FIU &** JS2LHJ. **JH7AFR &** Others. **JH7PKU &** JA9SSY, JHØBDK, JH7DXZ, JO1BMV. **JI2ZEY:** JA2BY, JA2BHJ, JA2BIL, JA2BIV, JM2CCL, JO2BBC. **JI2ZJS:** JA2AXB, JA2JDR, JA2JSF, JH2MYN, JH2UVL, JR2XOM, JE2HCJ, JG2TSL, JA1XHE. **JI3BFC &** JF3GKE.

JR1ZTT: JM4HHH, 7M4AZB, JJØCRL, JF4JYE, 7L1XCM, JFØMQX, JK2FGD, JRØUUU, K. Furuta, K. Furukawa, Y. Megumi, Y. Momoko, N. Mayoka, 7L1ETP, JK8CHX, JM3CRK, 7L3CQP, Hashimoto, JH6RFT, JK1JHU, JRØXHL. **KØDU &** KØCL, KØUK, NØZA. **K1DQV/3 &** K3UT, W2BZR, W4BA, KI4HK, K6LEW, W6NRJ. **K1RO &** K1ZZ, KA1ZD, N1ND, K5FUV, N5KO. **K1TO/4 &** K1TO, KA9FOX, NJ2L. **K2KV &** K2DO, K2KV, KS2G, N2GA, WM2V, K2HAB. **K2NG &** KR2W, N1ZR. **K2OWE &** KG2MY. **K2TR &** WA2SPL, NJ1F, K1EP, N2MG. **K2XR &** WB2BHC, K2OWR, VE3XAP, N2YFH. **K3OO &** KB3CLQ. **K3TUP &** Others. **K4ISV &** K4UVH, K4CM, K4UU, K4CMS, K4CN. **K4KDJ &** K4EP, KF4ZLX, 5B4AFM. **K4RC:** Williamsburg Area ARC. **K4VUD &** N4GI. **K5GN &** K5ZD. **K5MDX &** WQ5L, W5UE, KR4QQ, N5FG. **K5MR &** N5RZ, K5KA, N5TR, K5RX, N8SM. **K7ON &** NU7I.

K8AZ & K8DX, K8MR, K8NZ, W8GN, W8KIC, WB8K, WT8C. **KB8TI:** K8BVY, NE8I, KD8PA, KG8XQ. **KC1AL &** N1PZZ. **KC1XX &** KM3T, K1GQ, K1DG, KC1F, AD1C. **KC7V &** KY7M, K7SP, N7MB. **KC8KUQ &** KC8LBH. **KD9ST &** KA9SQS, KA9SQR, KB9EXE. **KF2XK &** N1QDA, W7YY. **KG2BN &** Others. **KG2FH &** KB2WVY. **KG4CM &** KG4AU (WV3N), KG4PT (N8QNW). **KG6MO &** WA6R. **KG6OK &** Others. **LA8W:** LA4DCA, LA8SDA, LA9EEA, LA9HW, LA9SEA. **LU1NF:** LU1NDC, LU8NA, LU1NAF, LU4NAZ, LU6HCV, Otto. **LU8XW:** Radio Club Ushuaia. **LX2LX &** LX1NO. **LY/K4ZLE &** LY2QJ, LY1DS. **LY2OM &** LY2BUU, LY2TX. **LY3AV:** LY1CQ, LY1CX, LY1DA, LY3BP. **LY3MV:** Aleinikovas, Kunickis, Ceckauskas, Urbonavicius. **LZ1KSN:** Karagyozov, Hadjiatanasov. **LZ9A:** LZ2CC, LZ2CJ, LZ2DF, LZ2EV, LZ2JE, LZ2PO, LZ2PS, LZ2TX, LZ4UU. **M8G:** GØLRE, G1AHM, GØUZF, G4WJR, G3ZRE, GØWTD, G7SUR, M1ADC, G4TZR, GMØKLP, GØLBT.

M8P: G3GAF, G3UHU, G4PWA, G4TNB. **M8S:** G4AGQ, MØAGQ, MØATQ, M1CJK. **MMØAMV/P &** MM1AVA, MM1CPP, MM1BEM, GM7OLQ, GM4UYZ, GM4XZZ,GM4WLL, GM4YMI, GMØALX, GMØCLN. **NØIJ &** Others. **NØNI &** WØFLS, WØETC, NØAV, KØKD, WOØV. **N1AO &** N1ZPC, KB1CHS, N1RLI. **N1AU &** WC1D. **N1IA &** KA1EKR. **N1SOH &** W1FM. **N1SP &** NK1F. **N1TB &** N1UJV. **N1WR/3 &** N3WZR, N3AFT, N3HRT. **N2LBR &** WA1KKM. **N2NU &** K2WI, W2REH, WW2Y. **N2ZX &** K2YR, NA2NA. **N3DL &** WU3M. **N4RV &** KT4W. **N4TO &** AE4RO, AE4SW, N4TO, NT4TT, W4JAM. **N5CMI &** K5WO, WB2LMA, KD5DBL. **N5HRG &** K9MK. **N5WNL &** N5PJ, WDØGTY, WL7FT. **N6IJ:** N6DE, K6ENT, AA6EG, K6EP. **N7IP:** KK7GW, KC7DZZ. **N7KQ:** K7OX, M. Smith. **N8NR &** N9AG, N8BJQ. **N8PR/4 &** W4ADJ. **NA5B &** K5TT, K5YP, N5OT, W5AO, WØRRY. **NE3F &** KS3F, K3ATO, NT3V. **NJ5S &** KA7GLA, N1UOC, KM5DH, KC5TFA.

NK7U & K7ZO, K7MK, N7BZ, W7ZRC, KC7DPD, KD7CB. **NP2B &** WD4JNS, W4OV. **NP2N/Ø &** WAØQMU. **OE3I:** OE1JNB, OE3DSA, OE1NPW, OE1BKW. **OE5T:** OE5OHO, OE3GEA, OE5MKM, OE5BWN, OE5ERN, OE5MRP, OE5MTN, OE5AMO. **OH1AF:** OH1MDR, OH1MM, OH1NOA, OH1JAY, OH6KZP. **OH6AW:** OH6MSZ, OH6UV, OH6EME, OH6KSR. **OH7AAC:** OH4XX, OH6LNI, OH7MHL, OH7KIR, OH7MS, OH7WV. **OH7AB:** OH7MM, OH7UE, OH7JVD, OH7NVU, OH7MN, OH5JOC, OH1WZ, OH7MA. **OK1KCF:** Club. **OK1KUO:** OK1UG, OK1FFC, OK1IUO. **OK2KDS:** OK2VWB, OK2HIJ. **OK2KOD:** OK2BHM, OK2WAZ, OK2BNX, OK2BJ. **OK5W:** OK1AEZ, OK1CF, OK1WF, OK1FKD, OK1DDO, TA2ZW, OK1JR. **OL2A:** OK2PDK, OK2HBY, OK2PEM, OK2JPR. **OL5Q:** OK1HRA, OK1FLC, OK1FFU, OK1XUV, OK1INC. **OL5T:** OK1DNR, OK1FHI, OK1FLM, OK1HSK, OK1MD, OK1RR, OK1TC, OK1TVA, OK8ANM, CE8PPA. **OL6A:** OK2PLK, OK2BMA, OK2CPD, OK2UQ, OK2BMJ.

OM3A: OM3CGN, OM3DX, OM8AM, OM8AW, OMØWR. **OM3KWZ:** OM7ARC, OM7AB, OM7AC, OM7AA, OM7ALH. **OT8C:** ON4ACA, ON4AJZ, ON4ALT, ON4AMI, ON4BCB, ON4CEQ, ON5OF, ON6SK, ON6MR, ON7UN, Dirk. **OT8K:** ON4ADZ, ON4ATV, ON4AVA, ON4AVT, ON4BCJ, ON4BCR, ON4ON, ON5SY, ON6HH, ON9CGB, ON1DI, ONL-4531. **OT8L:** ON1AFN, ON1DLL, ON1DFZ, ON1DMO, ON4AHF, ON4AKL, ON4AST, ON4BR, ON4CAF, ON4CIT, ON6NL, ON6ZX. **OT8P:** ON4GO, ON4LAM, ON4LEH, ON4LCW, ON4LDJ, ON4LZ, ON5OO, ON6AH, ON6MH, ON6QR, ON6VL, ON7PC OT8R: ON4AYL, ON4CFV, ON5RA, ON4BAQ, ON4CFX, ON4CHL, ON4AGY. **OT8R:** Club. **OZ7HAM:** OZ1ETA, OZ1BIZ, OZ1MAT. **OZ7HVI:** OZ5DK, OZ1CJX, OZ5AAM. **PA3DWD &** PAØCOR, PE1LAU, PA3AAV. **PI4CC:** PA3BAG, PA3EPD, PA3BSQ, PBØAIT, PBØAIU. **PI4WAL:** PAØABM, PAØRBO, PAØULT, PA3AGL, PA3HGJ, PE1PTQ, PE1RNT, PD1AEB, NL-4845, NL-11753, PA-9Ø13, PA-9851, PA-1Ø431.

PT2CM: PT3QX, PT2BAT, PT2LEL, PT2EZ, Andre, Renato, Thiago. **PY3UEB &** PY3KID, PU3SPY. **RA3AA &** RX3ACS. **RK3YYM:** UA3YBA, UA3YFA, UA3YMG. **RK4HYT:** RX4HB, RA4HBS, RA4HPI. **RK4WWA:** UA4WA, RW4WA, UA4WAN. **RK6XWY:** Lopatin, Plutaow, Golowko, Berbekow, Apshaew. **RK9AWN:** RA9AX, RK9AC. **RK9CWW:** RZ9CO, UA9CDT, RA9CMO, UA9FQY, RU9CO, UA9CIR, RA9CKQ. **RK9CZO:** RX9CAZ, RV9CFY, RV9CDW. **RK9SWF:** RZ9SR, RA9ST. **RK9SXB:** RU9SR, RW9TZ, RA9SKW. **RM6A:** RN6BN, RA6CM, RA6CO, RA6AX, RA6YY, RV6YY, RX6BA, RA6YDX, RU6AB. **RN3R:** UA3RAR, UA3RJ, RA3RFA. **RN4W:** RU4WJ, RW4WM, RW4WR, UA4WJF. **RZ9AZA:** RA9AB, RU9AN, RU9AZ, RZ9AR, RZ9AZ, UA9AJ, UA9BA, UN4L. **RZ9AZN:** RA9AQT, RW9AY, UA9ALE. **S5ØG:** S51F, S51QN, S56M, S57AW, S57MAD, S58M. **S5ØS &** S52ZW. **SK6AW:** SM6DER, SM6IQD, SM6MOJ.

SK6DG: SM6RXZ, SM6SMY, SM6SIF, SM6TKT, SM6TZD, SM6WBU, SM6WKE, SM6WKH, SM6WKC, SM6WKB, SM6SII, SH6ACE. **SK7BQ:** SM7BHM, SM7BQX, SM7GXR. **SM4VPZ &** SM4AIO. **SNØKRT:** SQ9FVR, SP9ADU. **SNØSON:** SQ9EZZ, SQ9HHT/9. **SNØZDH:** SQ5JBK, SP5IKC, SQ5HAR, SQ5CSW, SQ5EXM. **SP6KFA:** SP6MLG, SP6-1Ø1ØWR, SP6-1Ø11WR. **SQ6Z:** SP3DWQ, SP3HRN, SP3JZR, SP3RBI, SP3RBR, SQ3HMM, SP6HEQ, SP6XRZ, SP8NR.

T32MP: KØMP, NØKV, WØNF, AE7C. **T7ØA:** DF6QC, DL2MEH, DL4ABR, DL4OCL, DL5XAT, DL8OBC, IK4SXJ, IK4TVP, T77CD, T77LL, T77WI. **TF3IRA:** TF3AX, TF3GB, TF3RB, TF3HP. **TI5WFM:** TI5KD, JA6WFM, JM6EBU, JM6UAA. **TM1C:** F5ITK, F5LND, F5TRO, F6CTT, F6FVY, F8AKS. **TM2Y:** F6ARC, F6BEE, F6FGZ, F5MUX, F5NLY, F5SNJ, F9IE. **TM3A:** F5RXL, F6EXV, F5SSG, F5OZF. **TO8B:** EA3BT, EA3WL(YL).

TX8UA: FK8FU, FK8HA, FK8VHT. **UD6M:** UA6LO, UA6LV, UR5MVZ, RV6LOB, UT6IZ. **UPØL:** UN9LW, UN7LZ, UNØLW, UN7LAN. **UR3IWA:** UT3IM, UR5IFB, UR5IFX, US2IMA, US2IES. **UR4E:** UR5EAY, UR5ECW. **UR4MWU:** UR5MB, URØMM, US5MAX, UR5MCA. **UT3IZZ:** UT3IW, UT3IT, UX3IW, UX3IA. **UT4UWC:** US-U-Ø07, US-U-Ø83, US-U-Ø92, US-U-Ø91, US-U-1Ø9, US-U-Ø73, US-U-Ø75. **UT7Z:** Club. **V73AX:** V73A, V73AT, V73BN, V73UX. **VA3SK &** VA3MW, VA3JAK, VA3PC, VA3WTO, VE3KXX. **VE2CQW &** VE2DX, VA2CL, VA2JTR, VE2XID, VA2DOS, VE2LHR. **VE2CSI:** K1EU, K1JB, K1MV, VE2XY. **VE3DC:** VE3BK/VE3OZY, VE3JAI, VE3NVY, VE3OCY, VE3OZO, VE3SMF, VE3SS, VE3VMO. **VE3MIS:** VA3AJC, VA3PIE, VA3QMX, VE3CXT, VE3IMG, VE3SQG, VE3USC. **VE5SF &** VE5CPU, VE5TP, VE5DX, VE5RC, VE5JCJ, VE5SHK. **VE6AO:** VE6BIR, VE6JKZ, VE6RTL, VE6TC, VE6CIZ, VE6KC, VE6SI.

VE6FI & VE6AQ, VE6LB, VE6NA, VE6PY. **VE6SV &** VE6AKY, VE6EX, VE6BAB, VE6MRT, VE6NAP, VO1CV, VE6AQE. **VE7SZ &** VE7ON, VE7CFD, VE7SOD. **VE9WH &** VE9NIN. **VO2CQ &** VO1MP, VO1MX. **VO2WL:** K5NZ, W5BAK, N5RP, AD5Q. **VP2V/K7AR &** WJ7R, K9JF, N7MQ, N7MU, W7YAQ. **VP5DX:** AA4US, AB4UF, KC4FWS, N4KE, NU4Y, W3KT, W3LR, WA4DRU, W4SWZ. **VU2JNA:** VU3PVN, VU2RIG, VU2NLF, VU3KJA, VU2SXF, VU2JPN. **VU2WAP &** W9NGA. **WØTM &** KGØZI, W1XE. **W1HR:** W1JCC, W1MD. **W1W:** W1NR, W1BK. **W2CXM:** KB1CIU, N2WLG, KF6EXF, N1NMB. **W2DO/4 &** KE4IDW. **W2LC &** K1PY. **W2SEX:** K2ZR, K2YW, WB2AIV. **W3DXR:** K3UOC, K3USC. **W3GNQ &** KA3QPG, W3ZZ, WI2T, WR3Z. **W3MF &** K3PH. **W4CAT:** K1KY, WD4K, NU4JJ, W4KH. **W4NC:** N4VHK, WB4MSG, KO4MM, NØKTY, KT4CD, KC4WSK, Kf4KYD, KD4RGB, WB4KQN, KF4ILN, KE4TES.

W4SAR & KF4OAD, KE4ZBZ, KU4GC, KF4WXD. **W6EEN &** K6XC, W6AQ. **W6XR/2 &** N2AU, KA2CDJ, KB2YVC. **W7IG &** KC7Q, N7TL, N7HA, W7SIR. **W8PLP:** N8VYS, N8JM, KC8HGF, N8YQJ, KB8PSF, N8DEF. **W9JA &** K9GS, K9GY, K9JY, N9AU, N9FH, WE9V. **W9LT/8 &** K3ZJ, K8OQL, KU4KV, N4SLR. **WA1RR:** N1RJF, N1HRA, K1JN, KB1LN, KA1VMG. **WN9O &** W9IU. **WO1N &** K1WD, NF1A. **WP2Z:** W4WX, N2WB, W4CJK, VE3FU, W5OXA, AA9TK. **WP3A &** WP4NHM, KP2BH, NP3A. **WV1M &** N1IXF, N1TVL. **YE5B:** YB5QZ, YB5PD. **YL8M:** YL2KL, YL3DW, YL2GM, YL2AG. **YU1HFG:** 4N1DX, 4N1YL, YT1PNR, YT1VA, YT1TR, 4N1FTD, 4N1FMN, 4N1FYL. **YV4AA:** YV4FZM, YV4YC, YV4FJJ, YV4FJK, YY4GLD, YV5CVE. **ZP9X:** ZP9XG, ZP9XB, ZP9SC.

Station Operators Multi-Op Multi-Transmitter

4U1UN: IK2BHX, K2KQ. **8Q7IO:** DL7IO, DL7IQ, DJ7TO, DL2RUM, DL7BY, DL7UTM, DL7VRO, DL7VYL, ON4CHE, DK1BT, DL3APO, DL1SYL, DL1SXL, DL7VLA. **AA1ON &** W1RH. **AD1T &** K1ZO, N1KWF, WA1ZYX. **AF4EP &** K4WZ, KS4CG, KE4QFF. **AH2R:** JG3RPL/KF6BJ, JR3RVO/WX8M, JI3ERV/NH2C, JH7QXJ, JR8VSE, JH1NBN/K3ZB, JP1JFG/N2IU, JK3GAD/AL7NC, JR7OMD/WI3O. **B1A:** BA1OK, BA1AB, BG1HZF, BZ1BM, BG1SUN, BZ4DCH, BG1AZ, BG1BF, BZ1OM, OH2KI, OH2PM, OH2TA, OH2YY, OH6LI, OH2BH. **BWØR:** BV2KI, BV2KS, JH3GCN, JP1RIW. **CO2FRC:** CO2JX, CO2OJ. **DK5EZ &** DG3EX, DL1QW, DL3EBX, DL4EBW, DL9JT, DL6EAQ. **DLØCS:** DD7LO, DG8LAM, DJ5LA, DJ9MT, DK2OY, DK8LV, DL1LAA, DL1QQ, DL2LAR, DL3LAB, DL4GBA, DL4RDJ, DL6RAI, HA1AG. **DX1D8T:** Don Bosco Technical College Club.

DX3T: DU3HC, DU3WG, DU3AR, DU3MIB, DY3KQA. **E22AAA:** HS1CHB, E21IZC, E2ØMYS, E2ØNVH, E2ØNGF, E2ØLIB, E2ØJPJ, HSØ/OE1GZA, HSØ/IK1LZF. **E22AAD:** JA6GIJ, JA6LCJ, JF1PJK, JE1JKL. **EA3CCN &** EA3ALV, EA3CKX, EA3EJI, EA3ESJ, EA3EZD. **EA9EA:** EA1AK, EA4DX, EA4KD, EA4KR, EA7IL, EA7KW, EA7TH, EA7TL, EA9AI, EA9AZ, EA9GK, EA9KB, EA9UG. **ED4RAX:** EA4AHW, EA4ABW, EA7CO, EC4ANZ, Diplomado 29/65564/XII. **ED7VG:** EA7HY, EA7ATX, EA7EZQ, EA7GNC, EA7CCA. **HBØ/HB9AON &** Others. **HG6Y:** HA2RX, HA6ND, HA6NF, HA6NL, HA6NY, HA6PX, HA6ON, HA6DX, HA6OB, HA6OI, HA6OQ, HA5BSW. **IH9P:** K7FL, ZS6NW, IT9WPO, IT9BLB, OK1FUA, KR7X, WA7EQW, I8QLS, W1NA(I8CZW), IN3QBR, IT9VDQ, IT9TQH, IT9EWG, IW9EIN, IW9GFE. **II2P:** I2CMA, IK2HNA. **J3A:** W8KKF, WA8LOW, NØAT, NØKK, K5PN, W5WW, K6HR, NH7C, NH7CC, ES7RE, DL6LAU, IK6CAC, IV3VIA, VE3RZ.

JA1YPA: JA1PEJ, JA1ATK, JA1QJK, JH1AZO, JM1NKT, JF1KOB, JO1CRA. **JA1YXP:** 7N3PZJ, JE1CKA, JF7TFK, JH1EAQ, JH1GTV, JI4RDO, JJ2JQF, JL2FJA, JL2TAW, JM1UWB, JP1OGL, JQ1BRW, JR1AIB, JS1INN, N3NQL, H.Masuda. **JA4EKO:** JE3MAS, JA4EKO, JF4FUF, JG4CLV, JH4NMT, JH4VDP, JN4FEU. **JA5BJC:** JA5BJC, JA5FDJ, JA5JCC, JA5THU, JH5FXP, JH5RXS, JR5JAQ, JR5VHU. **JA6ZPR:** JH6JSR, JH6ETS, JH6SQI, JR6BSC, JR6HVE, JR6CKX, JR6HLR, JQ6CEC. **JN1YUU:** Shizu, Nanbu, Hirashima, Miyazaki, Kai, Hirose. **JR7ZIT:** JK1BEY, JQ1UKK, JK7KCC. **KØUE &** KEØNF, KBØNUY. **K1NU &** Others. **K1RX &** KF1V, K1EPJ, K1CC, K1OZ, KA1UQ, KR1G. **K2RD/1 &** W1CU. **K3ANS &** WF3H, W2NO, W2CG, AA2WN, KC2ZA, W3LR, WØRSJ/3. **K3DI &** W3ICM. **K3II &** K3CT, K3TEJ, K3PP. **K3LR &** N3RA, W3GH, ND8L, K8GL, K9VV, K5TR, K8CX, K3UA, XE2AC, W8JV, KA3JWJ.

K6SG & K6NO. **K9NS &** AA9D, K9DX, K9HMB, K9PW, K9RS, KS9U, W9RM, W9QA. **KB1H &** AA1CE, K1EBY, NB1U, KB1DFB, N1XYS, K1NG. **KD2KS &** K2WB. **KF9YT &** N9VVV. **KH7R &** KH6ND, KH6TO, KH7U, AH6OZ, KL7Y, ND3A, K9QQ, K9PG, K9NW, AH7R, KH7L, WH6XR, WH6H, AH6LV, NH6XO. **KV1W &** W1CSM, N6RFM, K1MBO, KE1FO. **LA1K:** Club. **LU4FM:** LU1FA, LU1FAM, LU1FAK, LU1FZR, LU2FT, LU2FYU, LU3FP, LU3FCK, LU4FA, LU4FPZ, LU4FVG, LU5FAO, LUU6FA, LU6FUQ, LU6FEC, LU8FPT, LU9FEC, LU9FIO, LU9AY. **LY5A:** LY2PAJ, LY3BY, LY3MM, LY2FY, LY2LA, LY2KW, LY2IJ, LY1BA. **LY7A:** LYR-346, LY3DR, LY2OC, Toleikis, LY3DA, LYB-26, LY3RJ, LY2NKJ, LY4AA, LY2UF, LY2KZ, LY2AO, LY3IT, LY2NLL, LY2NK. **LZ5Z:** LZ1UQ, LZ1BMV, LZ1HST, LZ1MCJ, LZ2HM, LZ3FN, LZ3SM, LZ3DJ, Vasco, etc.

IR1A: Max, IK1GPG, and Betty, IK1QFM.

M8T: G4BAH, G3XTT, G3WGN, OH6YF, G4VMM, GØCYB, G4BUO, G4TSH, G4JVG, G4PIQ, G4BWP, GØAEV, GØKRL, GØWCW, GØOZS, G3PJT, GØHSS, GØAFH. **N1KWJ &** KD1LU, KA1ZOI, N1LCE. **N2MM &** K2UT. **N2RM &** N2RM, WM2H, N2NC, K2TW, N2AA, N7BG, N2NT, W2RQ, WC4E, K2BM, KB2BF. **N5YV:** NX5M, N5XJ, N4GCA, AC5GH, KA5BKG. **N6AW &** W6BA, AD6DO, K6CU, W6RW, W6HT, K6HMS, N6MY, K6WS, N6KI, K6AM, N7CQQ. **N98ITU:** KTØR, NE9U, WØAIH, KØOB, KØXQ, WØUC, W9WW, KN4T, KB9S, WAØRBW, KØTG, AAØZZ, KBØVRV, KIØF, N9ISN, UN7QF, N9THC, WRØDK. **NQ4I &** W4SVO, K4JYO, K4JNY, AD4J, KØEJ, KV4T, N9HZQ, N4CM, W4DD, AA4LR. **OH2HE &** OH1JT, OH2BVI, OH2BZY, OH2IW, OH2JA, OH2RA, OH2XX, OH6CT, OH6DD, OH6EI, OH7BX, OH7JR, OH8KXK, ES2RR/OH2LUR. **OK1KIR:** OK1AWH, OK1DPB, OK1IMJ, OK1IPN, OK1MKX, OK1PG.

OL7W: OK1DUT, OK1FUT, OK1VBA, OK1FDR, OK1FHL. **OT8A:** DF3TJ, DF5RF, DF6PW, DJ4AX, DJ9IE, DL3EBM, GØBZF, K1WY, ON1AAE, ON4AEI, ON4AFF, ON4AWB, ON4BQI, ON4CIM, ON4CKE, ON4DEL, ON4DJU, ON4DLJ, ON4DOH, ON4GL, ON4MAR, ON2AIM, ON4AJW, ON4AKV, ON4AMX, ON4ASB, ON4ATW, ON4AVM, ON4AWH, ON4AWU, ON4AWV, ON4BAG, ON4BI, ON4CAT, ON4CBP, ON4CCL, ON4CCM, ON4CDC, ON4CDE, ON4CET, ON4CFQ, ON4CGD, ON4CGJ, ON4CGP, ON4CGS, ON4CHO, ON4DB, ON4FG, ON4FI, ON4MV, ON5AI, ON5CD, ON5DH, ON5GO, ON5OT, ON5RW, ON5UM, ON5WL, ON6HP, ON6HZ, ON6LK, ON6PU, ON6RW, ON6UA, ON7GB, ON7HU, ON7NB, ON7NQ, ON7SF, ON7YZ, ON9CFB, ONL1Ø116, Linda, Marc, Nathalie, PA3EZL. **P3A:** RA9JX, UA9MA, RZ3TX, UA9YAB, UA3DPX, RVØAR, UA3AB, UA9NJ, UN7FZ.

PI4COM: PA3BWD, PA3BXC, PA3CAL, PA3DXA, PA3ERC, PA3EWP, PA3FQA, PE1PZS, JH9GGH. **PJ9B:** K1XX, K2SS, K3EST, K3MM, KB2XZ, KL2A, N3ED, N6IG, W3UM, WA3LRO. **PY3MHZ &** PU3AGP, PY3AFS, PY3BZA, PY3FOX, PY3MRZ, PY3PAZ. **RN3D:** RK3AW, RW3FO, RA3ATX, RW3AIG, UA3QDX, RV3FF, RV3BA, RU3BA, RV3DVN, RX3DCX, RZ3FA, RK3FA, RV6HY, UA1OMX, Ross, Sco, Dima, Old Alex. **RW2F:** RA2FA, RA2FZ, RN2FA, UA2FB, UA2FC, UA2FF, UA2FJ, UA2FM, UA2FX, UA2FZ, Andre, Dima. **SK6NP:** SM6FUD, SM6BUV, SM6MVE, SM6PIS, SM6VUL, SM6WQA, SM6WQB, SM6WWK, Rickard. **SP5ZCC:** SP5MBQ, SP5UAF, SP5UAX, SP5TAT, SQ5BPM, SQ5BPT, SQ5EBL, SQ5EBJ, SQ5HAB, SQ5SJR, SQ5VJB, Jarek. **T88X:** JA6VZB, JA1WSX, JF1MIA, JR6IQI, JQ6GDP, JHØXUP/6, JE2PCY. **TM2LEA:** F5TCM, F5SNH.

V26B: AB2E, KA2AEV, N2TK, N3BNA, W3CF, K3MQH, WT3Q, N3OC, WXØB, NM5M, ZP5AZL. **VE3EJ &** UT4UZ, VA3EFM, VA3NA, VA3RU, VE2ZP, VE3EJ, VE7CC, VE7NTT, VE7ZO. **VE3SY &** VE3BUC. **VE5RI:** VE5CJR, VE5CMA, VE5FC, VE5FD, VE5FF, VE5FN, VE5SJA, VE5TR, VE5WI, VE6BBP, VE6SJA, VE6EZ. **VE6JY &** VE6LDX, VE6MK, VE6RIT, VE6STE, VE6DGG, VE6BLA, VE6DXX, VE6MAA, VE6TX, VE6JO, VE6DYB, VE6WQ, VE6JTM. **VP5T:** WA2VYA, WA3RHW, N2VW. **VY2SS &** AA1AA, K2NJ, K2XT, VE9DX, VE9GJ, VE9MY, VY2CC, VY2CD, VY2GWM, VY2LI, W1VE. **W1FJ &** W1KM, NB1B, KU4BP, KQ1F, K1XM, N1RR. **W1GQ &** Others. **W1QK &** AA1MY, N1GS, N1TMG, N1TIV, W1QJ, W1QK, K2ZZ. **W1WFZ &** K1MK. **W1YK:** KM1P, N1FIY, N1PFC, N2YHK, N8YXR. **W2A:** Club. **W2AX/1 &** K2LE, K2SX, K2UU, N2UN, NA2M, W2AX, W2II, VE1AL, VE1XT.

W2XT & W2ED, KB5U, N2UYV, N3QDC, KE2HG, N2VM, WA2F, W2VRK, KB2VRO. **W3LPL &** K1HTV, K1RA, K1RZ, W2GG, ND3F, N3GB, K3KY, AI3M, K3RA, KD4D, K5OF, N5OKR. **W3MM &** W3FV, KF3B. **W3PP &** AA1K, NW3Y, N6ZO, KE3ZR, NX3A, K3FT, N3WDL, N3YHC, N3KNT. **W4MYA &** K4BAM, KB4DI, KB4YPN, KD4JXY, KF4QQY, N4EHJ, N4ZJ, W4DAA, W4DR, W4HZ, W4MYA, W4PFM (5X4F), W4SPT, WA4DAI, WA4QDM, WK4Y, WU4G, Lilly. **W6FSJ &** Others. **W7RM &** K1TA, KI7Y, K5ZM, NC7M, K7KX, K7SS, K7ST, WAØRJY, N7TO. **W8ZA &** K3SX, K3DNE, WD3A. **XX9X:** AB6BH, K5OT, K6JL, K6MC, N6AA, N6ZZ, W6XD. **YB3ZES:** YD3JTR, YD3BMB, YD3TYO, YD3TWZ, YD3BHR, YC3DKN, YC3SZM. **YZ7W:** YT7DQ, YZ7MJU, YZ7RLY, YU7MO. **ZM2K:** ZL2AMI, ZL2IQ, ZL2IR, ZL2ST, ZL2DX, ZL1CN, ZL2AL, ZL2ARF, ZL2ASD, ZL2AUB, ZL2BPL, ZL2BSJ.

Number groups after call letters denote following: Band (A = all), Final Score, Number of QSOs, Zones, and Countries. An asterisk (*) before a call indicates low power. Certificate winners are listed in boldface. (All country terminology reflects the DXCC list at the time of the contest.)

SSB RESULTS
SINGLE OPERATOR
NORTH AMERICA

UNITED STATES

K1AR	**A**	**5,952,375**	**3121**	**156**	**559**
K5ZD/1	**"**	**5,481,048**	**3080**	**145**	**491**
					(Opr. W2SC)
W1WEF	**"**	**2,819,586**	**1934**	**128**	**433**
KQ2M/1	"	1,789,984	1431	118	370
K5MA/1	"	1,626,816	1332	112	346
W1TE	"	1,421,490	1101	110	380
KD1YN	"	1,405,107	977	117	396
K1RM	"	1,336,215	1247	88	301
W1ZT	"	1,166,844	945	111	368
W1KRS	"	977,390	814	95	335
K1YT	"	911,640	822	105	321
W1RY	"	806,784	764	91	293
WØMHK/1	"	770,364	734	88	290
W1UK	"	719,394	706	96	305
K1CN	"	604,500	596	96	276
N1API	"	596,594	745	71	246
N1EZC	"	503,084	567	85	261
W1ZS	"	422,940	563	66	219
W1AX	"	393,962	532	65	216
KE1IH	"	359,520	455	81	240
W8HAP/1	"	332,400	496	77	223
K1BV	"	309,118	505	67	187
WB1GEX	"	274,594	410	69	182
K1AE	"	224,361	339	63	194
KM3T/1	"	158,641	336	46	127
KE1KD	"	138,170	261	56	149
W3TB/1	"	122,385	270	58	141
K8CH/1	"	85,176	211	45	124
W1WTG	"	69,046	153	53	105
AA1SU	"	43,648	154	44	84
K2LP/1	"	38,544	150	48	98
W1DEO	"	37,146	127	53	98
W1FV	"	32,857	122	32	71
K1BW	"	16,287	61	36	53
WS1M	**28**	**209,808**	**598**	**29**	**115**
KB1DEA	"	18,340	112	17	53
KA1PRD	"	12,644	93	14	44
N1UVA	"	1,200	21	10	15
K1DWQ	**14**	**154,354**	**394**	**35**	**107**
AA1KM	"	4,232	66	14	32
K1FZ	**3.7**	**234,260**	**699**	**27**	**103**
					(Opr. K1UO)
KE1Y	**"**	**130,005**	**602**	**21**	**86**
K1LZ	**"**	**122,605**	**518**	**23**	**90**
KR1G	"	74,263	301	22	81
W1MK	"	5,940	63	16	38
AA1BU	**1.8**	**4,042**	**60**	**12**	**31**
***WA1S**	**A**	**1,516,347**	**1120**	**114**	**383**
***K1VUT**	**"**	**1,241,934**	**1005**	**106**	**355**
***K1VW**	**"**	**1,087,384**	**1019**	**115**	**321**
***WS1A**	**"**	**1,012,440**	**890**	**99**	**330**
***WT1O**	**"**	**963,500**	**894**	**99**	**311**
*N1HOQ	"	791,895	777	94	299
*KS1J	"	763,389	889	84	279
*N1PGA	"	755,136	754	86	282
*W1EQ	"	614,884	679	83	264
*AA1QD	"	500,410	595	77	230
*K1HT	"	498,986	541	86	261
*W1NT	"	489,118	629	79	243
*W1ZZ	"	461,610	494	90	255
*WA1FCN	"	457,500	610	76	229
*NM1W	"	292,050	405	65	210
*K1TW	"	262,856	419	62	170
*WF1L	"	230,460	400	58	172
*K1JE	"	210,220	362	57	173
*WA1T	"	157,832	293	64	154
*K1OA	"	147,664	306	46	130
*K1VSJ	"	125,874	242	52	137
*K1DCB	"	119,966	303	46	108
*KX1X	"	112,700	253	46	129
*KG1D	"	107,830	225	57	148
*K1WCC	"	83,235	225	40	115
*N1DS	"	54,362	201	47	107
*K1MAC	"	31,611	121	39	84
*AB1U	"	17,806	111	25	33
*N1SR	"	16,235	91	32	53
*K1PLX	"	15,200	76	26	50
*KA1ZFK	"	12,136	71	26	48
***NY1E**	**28**	**127,134**	**382**	**26**	**100**
*W3EP/1	"	100,125	287	26	99
*W1GOU	"	23,800	130	17	51
*N1FUS	"	20,100	110	20	47
***WG1Z**	**7**	**8,480**	**65**	**15**	**38**
N2LT	**A**	**3,572,140**	**2270**	**136**	**436**
K2DM	**"**	**3,068,044**	**2020**	**128**	**425**
KE2VB	**"**	**1,410,320**	**1137**	**113**	**375**
WA2C	"	1,358,730	1097	120	367
W2EN	"	1,160,705	960	106	349
N2ED	"	1,137,855	1038	115	350
N7UN/2	"	1,006,824	875	114	347
N2MR	"	899,101	816	101	312
WA2NHA	"	818,125	849	86	299
N2WK	"	775,719	727	113	328
N2CU	"	643,440	711	77	259
K2WK	"	593,205	643	103	252
K2OY	"	500,180	527	106	250
K2FR	"	385,296	535	65	211
W2UDT	"	307,468	457	71	207
W2LU	"	306,504	382	89	208
WA2CNV	"	287,330	437	76	219
WR2V	"	279,112	397	70	208
N2UM	"	255,774	403	82	200
K2AW	"	229,596	368	56	172
W2OMV	"	222,443	363	61	180
NC1A/2	"	174,476	324	53	159
KE2WY	"	169,260	291	63	147
K2NV	"	162,140	300	56	164
KU2X	"	154,912	312	54	152
K2SZ	"	153,440	257	62	162
WA2WVL	"	136,427	207	73	154
W2OP	"	118,371	257	63	148
W2HCA	"	113,022	236	53	129
AE2T	"	107,439	228	52	125
WF2Y	"	106,506	213	53	130
W2ZU	"	80,227	190	45	112
N2OO	"	54,000	131	52	92
WA2YBI	"	34,440	116	43	77
K2SKO	"	31,702	159	35	86
N2KI	"	25,235	131	33	70
W2EZ	"	1,914	24	13	20
N2LEB	"	868	16	15	16
N2BA	**28**	**303,246**	**772**	**30**	**123**
K2EEK	"	53,724	193	24	87
WB2ELW	"	17,043	120	18	51
					(Opr. K2CF)
KA2VVO	"	360	17	7	13
WA2QNW	**21**	**339,200**	**773**	**32**	**128**
WB2YQH	"	127,788	372	29	109
KA2JEM	"	62,010	245	25	81
K2MGA	**14**	**154,100**	**462**	**31**	**103**
K2JLA	"	43,927	175	26	83
K2WE	**7**	**63,162**	**208**	**27**	**94**
KQ2O	"	16,632	93	17	60
KM2P	**3.7**	**150,150**	**627**	**21**	**89**
W2VO	**1.8**	**6,096**	**68**	**15**	**33**
***NA2U**	**A**	**1,288,518**	**1065**	**109**	**353**
***K2UF**	**"**	**536,860**	**580**	**83**	**257**
*K2CS	"	393,329	536	79	210
*W2TZ	"	254,400	407	68	197
*KM2L	"	189,390	335	64	150
*W2SSB	"	172,788	286	59	179
*W2BE	"	129,970	268	58	147
*W2MKW	"	121,338	237	58	131
*N2NYR	"	99,876	213	50	124
*KC2TA	"	82,992	200	45	111
*N2CK	"	59,920	172	43	97
*W2YK	"	55,068	163	47	109
*W2CVW	"	52,380	147	38	97
*WF2B	"	51,042	158	46	95
*W3EH/2	"	50,625	153	41	84
*N2LQQ	"	46,854	166	46	91
*W2FGY	"	42,978	142	33	81
*K2GKM	"	42,721	134	37	82
*N2ST	"	35,280	140	36	84
*K2DL	"	18,990	85	30	60
*W5KI/2	"	16,770	80	34	52
*N2FR	"	12,320	82	20	50
*KG2NO	"	3,036	38	18	26
*WB2SXY	"	2,583	32	15	26
*WA2BHJ	"	1,610	29	17	18
*W2UL	"	1,150	21	9	14
*N2LDV	"	620	12	9	11
*WB2KHO	"	234	7	6	7
***K2MFY**	**28**	**144,560**	**394**	**28**	**111**
*NA2X	"	26,828	128	21	55
*N2DEM	"	22,596	126	21	63
*WA2BKN	"	17,464	109	18	41
*KB2NLL	"	3,096	41	11	25
*WB2BWU	"	14	14	7	7
***K2BQW**	**21**	**84,930**	**280**	**23**	**91**
*WA2ASQ	14	25,418	120	20	67
***WB2ZTH**	**7**	**10,868**	**68**	**16**	**49**
K3ZO	**A**	**3,815,240**	**2331**	**140**	**458**
W3BGN	**"**	**3,401,478**	**2113**	**140**	**466**
N3NS	**"**	**1,198,322**	**962**	**112**	**355**
K4JLD/3	"	783,874	702	105	308
K3ZA	"	507,338	595	80	258
AJ3M	"	385,200	507	88	212
N3KR	"	343,757	457	75	202
NY3Y	"	330,639	413	88	219
N3RC	"	294,769	459	76	205
KC3TL	"	292,934	438	82	216
NY3C	"	268,710	381	70	195
AD3Z	"	264,765	343	75	210
W7CAV/3	"	251,564	388	64	180
NI3I	"	235,060	376	60	109
W3RJ	"	220,215	361	79	186
WF3M	"	166,200	310	57	143
W3BYX	"	124,614	221	56	151
N3GBP	"	121,590	279	56	137
W3TWI	"	115,434	238	64	134
W3AU	"	108,675	262	44	117
K3SV	"	100,858	196	65	146
W3BEN	"	78,540	208	55	132
W3EVW	"	54,008	235	48	124
N3QYE	"	42,720	157	39	81
W3JRY	"	17,200	76	30	56
K3MLA	**28**	**55,737**	**215**	**28**	**71**
W3KHQ	**21**	**195,534**	**485**	**32**	**121**
AI3Q	"	146,300	378	31	109
K3MD	"	122,000	419	27	98
K3CR	**14**	**543,904**	**1188**	**38**	**146**
					(Opr. WA3HAE)
KB3AGZ	"	18,970	102	17	53
***KQ3V**	**A**	**1,195,116**	**916**	**120**	**369**
***WW3S**	**"**	**910,610**	**834**	**100**	**310**
*W3UJ	"	577,850	727	84	266
*NV3V	"	270,900	453	69	189
*WB3CIW	"	257,854	413	53	176
*N3KCJ	"	191,754	345	52	149
*KB3MM	"	93,100	213	47	128
*KF3BQ	"	53,592	168	43	89
*W3YD	"	52,394	176	39	95
*N3YEA	"	45,124	150	39	77
*WA3JJM	"	38,934	145	44	82
*N3TG	"	35,032	117	38	78
*N3NZ	"	17,346	92	34	64
*N3EYB	"	8,437	57	19	40
*WA3YSW	"	5,900	48	23	36
***KT3RR**	**28**	**148,905**	**463**	**29**	**106**
*N3RW	"	95,536	313	26	86
***W3CP**	**21**	**49,686**	**214**	**20**	**78**
***K1EFI/3**	**14**	**46,400**	**180**	**21**	**79**
***WT3W**	**3.7**	**9,196**	**104**	**11**	**33**
W4AN	**A**	**4,989,960**	**2770**	**156**	**512**
K4AB	**"**	**2,747,136**	**1834**	**145**	**443**
N4VZ	**"**	**1,948,311**	**1135**	**150**	**489**
N4KW	"	1,933,151	1543	119	354
AA4S	"	1,926,795	1319	131	402
N6AR/4	"	1,904,650	1371	128	422
NX9T/4	"	1,535,233	1151	119	378
W4MS	"	1,210,755	1012	113	342
N4UH	"	1,027,485	980	97	308
WA4TII	"	1,013,012	791	128	356
AD4TR	"	890,420	945	103	319
AG4W	"	786,301	747	102	289
K4PHE	"	738,420	767	95	277
K1PT/4	"	691,679	686	98	293
NW6S/4	"	642,372	595	102	296
K4LTA	"	583,054	663	110	291
K4LM	"	529,429	531	109	280
WA4JUK	"	504,000	624	84	216
N4CW	"	485,384	547	85	247
K9HUY/4	"	461,044	527	84	232
K3KO/4	"	453,140	541	85	241
KF4ZR	"	432,523	538	94	249
K4HA	"	426,827	488	96	253
KR4TG	"	400,500	473	96	260
KC4B	"	356,298	508	64	194
W2YE/4	"	330,797	407	79	214
K4MD	"	311,808	426	102	234
WA4MSU	"	269,000	404	78	191
K4RZ	"	259,128	400	66	178
W4NTI	"	238,392	300	71	193
N4GN	"	229,910	320	88	189
K3BYV/4	"	214,193	340	68	191
KD4CDB	"	208,000	391	77	173
N4EK	"	203,376	359	69	154
W4UEA	"	195,408	313	75	161
N4AF	"	173,658	329	58	148
K5VG/4	"	160,928	301	58	156
W4ZW	"	156,392	272	71	155
W4ASM	"	134,800	304	55	145
W4IF	"	79,500	186	39	111
W4OGG	"	76,725	103	53	102
KD3GC/4	"	75,450	202	50	100
W4WR	"	73,326	373	33	68
K1SE/4	"	60,489	174	41	100
KB4MIL	"	46,576	150	48	94
N4MM	"	44,892	127	50	79
W4PRO	"	41,985	112	48	87
KB4DJR	"	41,884	143	50	98
K4BAI	"	41,128	159	36	61
K4DXA	"	38,125	139	40	85
W4PA	"	24,308	81	43	75
W4SI	"	19,760	109	20	45
W4NZC	"	9,272	56	23	38
K7LU/4	"	7,670	64	20	45
N4KN	"	1,276	35	21	23
N4BP	**28**	**388,950**	**1021**	**31**	**119**
AI2C/4	"	169,740	456	31	107
WB4OSN	"	122,850	324	30	105
K4WX	"	76,248	296	26	82
W4VHF	"	42,488	166	24	70
K3OSX/4	"	25,758	118	21	60
NN4T	**21**	**552,292**	**1269**	**33**	**136**
W4MR	**"**	**400,368**	**1011**	**30**	**122**
					(Opr. KS4XG)
N4PN	"	286,359	811	32	127
K4XS	**14**	**705,272**	**1490**	**40**	**144**
W4RRR	"	233,970	537	38	127
K8WK/4	"	136,059	562	31	102
AA4ZZ	"	8,949	64	16	41
KZ2I/4	**7**	**74,732**	**237**	**27**	**92**
NC4NC	"	45,200	177	28	85
N2FY/4	"	11,895	70	19	42
AA4WX	"	144	6	4	5
K4ZW	**3.7**	**188,500**	**562**	**26**	**99**
W4DC	"	48,594	241	21	70
W8WW/4	"	13,962	99	20	58
AA4MM	**1.8**	**1,254**	**35**	**8**	**14**
***N4DL**	**A**	**887,295**	**872**	**101**	**296**
***WO4O**	**"**	**829,830**	**793**	**110**	**307**
***W4PJ**	**"**	**532,928**	**563**	**91**	**261**
*K4IE	"	445,822	553	94	244
*W4LC	"	350,446	469	72	202
*K4LQ	"	301,840	422	74	206
*N1CC/4	"	301,530	422	77	208
*WB4OMM	"	277,970	435	75	191
*N4IG	"	244,215	395	64	179
*K5DXR/4	"	169,970	311	64	166
*K3TD/4	"	167,473	297	73	150
*KD4IBI	"	140,976	289	47	131
*W4JH	"	130,756	255	48	146
*KT4XA	"	102,414	231	51	118
*W4KYW	"	85,094	197	50	107
*W4SD	"	67,942	162	50	111
*WR4K	"	60,768	177	41	103
*AA4KD	"	60,102	167	53	109
*K4UVT	"	51,340	128	44	107
*KA8FSM/4	"	37,211	134	39	88
*KF4ZTJ	"	30,353	132	49	78
*KS4RX	"	27,573	173	29	72
*KC4AUF	"	27,430	155	47	83
*KS4YX	"	27,234	126	35	67
*KE4YTC	"	23,265	118	32	67
*W4YE	"	22,517	95	31	58
*KE4JHJ	"	22,454	95	37	72
*KT4HN	"	18,988	79	31	63
*WB4DNL	"	18,616	70	41	63
*KD4BRJ	"	14,620	94	37	49
*N4WYR	"	12,717	65	33	48
*AA2GS/4	"	7,412	47	32	36
*N4BTO	"	3,783	36	15	24
***KC2KU/4**	**28**	**127,116**	**412**	**32**	**100**
***AJ4Y**	**"**	**122,625**	**380**	**30**	**95**
*K4TMC	"	103,847	341	25	88
*KE4HRH	"	72,490	267	26	84
*K4WW	"	48,985	195	25	72
*KR4YL	"	35,026	161	24	59
*KD4RHT	"	18,688	120	18	46
*KE4MVK	"	12,925	97	17	38
*W4JIK	"	9,212	75	13	36
*KD4RSL	"	2,604	33	11	17
*KC4YVA	"	840	18	9	12
*KF4UUI	"	204	7	6	6
*W9CNF/4	"	165	6	5	6
***N4MO**	**21**	**243,460**	**625**	**31**	**117**
***K4SN**	**"**	**133,416**	**404**	**30**	**106**
*NY4T	"	47,940	204	24	78
*K5WTA/4	"	10,229	73	16	37
***K4PC**	**14**	**221,998**	**594**	**34**	**123**
***WD4CNZ**	**"**	**55,800**	**240**	**20**	**80**
***W4UM**	**7**	**31,770**	**140**	**23**	**67**
*K4LDR	"	2,660	39	12	26
N3BB/5	**A**	**3,232,413**	**2440**	**141**	**372**
W5MN	**"**	**1,272,503**	**1208**	**112**	**307**
W5WMU	**"**	**1,164,908**	**1146**	**127**	**336**
					(Opr. KZ5D)
AB5SE	"	1,116,416	995	120	328
K5DX	"	970,368	915	121	327
K5YAA	"	863,732	926	93	269
N5KC	"	644,760	824	86	238
					(Opr. W5ASP)
W5GCX	"	558,764	652	90	236
AE5T	"	476,307	772	99	252
AB5C	"	318,890	436	88	198
WA5IYX	"	240,196	434	69	143
N5QDE	"	238,908	354	78	180
KC5AK	"	196,444	311	88	180
K5RAC	"	145,426	280	62	116
AE4PB/5	"	128,288	261	76	135
KC5YEE	"	92,664	254	69	129
KZ5MM	**28**	**597,144**	**1544**	**34**	**145**
W5OB	**"**	**404,379**	**1097**	**34**	**119**
					(Opr. K5NU)
W5CTV	"	51,429	204	26	67
WA5SOG	"	40,824	185	22	59
K1IM/5	"	20,121	147	19	38
KB5MSN/N	"	19,040	102	19	51
W6PU/5	**21**	**339,048**	**965**	**34**	**102**
NA4M/5	"	254,408	695	32	122
W5FO	**14**	**172,211**	**468**	**39**	**130**
W5JRP	"	18,768	109	23	45
***N5TJ**	**A**	**637,446**	**650**	**116**	**277**
***N5AW**	**"**	**497,674**	**613**	**96**	**253**
*W5CWQ	"	424,005	499	105	240
*N5RXF	"	367,275	507	88	207
*NN5T	"	324,120	435	91	201
*K5OE	"	268,888	452	78	166
*AA5CK	"	231,768	416	80	142
*AF5Z	"	110,000	210	59	141
*N5XT	"	49,416	141	52	90
*N5AF	"	30,520	122	42	67
*KM5LO	"	1,350	40	9	16
***KR5V**	**28**	**142,410**	**408**	**31**	**110**
*KD5FFK	"	26,390	151	19	46
*KD5DFJ	"	8,413	70	16	31
*KC5ZJA	"	8,268	54	19	34
*KB5UOK	"	4,625	60	12	25
***NY5B**	**21**	**173,088**	**560**	**32**	**112**
*KD5FJW	"	3,726	79	12	15
WC6H	**A**	**2,699,175**	**2346**	**129**	**306**
					(Opr. NU6S)
K6GX	**"**	**1,776,620**	**1526**	**120**	**302**
					(Opr. K5RR)
KI6CG	**"**	**1,276,560**	**1478**	**106**	**218**
W6TK	"	1,006,170	1149	105	225
N6IC	"	621,152	705	105	224
NN6XX	"	471,761	629	86	197
N6NG	"	303,249	441	91	180
K6GT	"	290,966	466	81	166
W6KNB	"	270,300	469	74	138
N6VH	"	253,800	415	82	143
KG6AO	"	231,312	393	83	154
N6TW	"	230,860	375	83	155
KE6EFO	"	187,912	442	63	103
K6HRT	"	175,967	364	63	124
K6FO	"	167,272	308	77	129
N6IBP	"	165,356	167	76	115
W6ISO	"	145,200	314	61	115
N6AZR	"	115,362	363	59	115
WW6O	"	113,796	265	61	113
N6AFI	"	104,574	270	68	106
N6PLQ	"	101,520	256	55	89
K6III	"	97,600	261	64	96
W6MFC	"	96,436	216	65	105
KO6XB	"	95,811	293	45	64
N6BZA	"	94,848	249	59	93
N6TNX	"	91,770	195	69	121
N7UE/6	"	88,734	263	53	85
KT6TT	"	70,744	162	56	92
N6TNW	"	51,380	147	51	89
K6UO	"	43,264	152	35	69
W6YM	"	9,504	64	23	31
W6YA	**28**	**420,930**	**1166**	**32**	**103**
W6NL	**"**	**389,838**	**1097**	**30**	**99**
KA6BIM	"	202,080	641	30	90
K6JOX	"	175,000	787	29	71
WA5VGI/6	"	118,272	475	24	64
W6DCC	"	36,334	178	23	51
K6MA	"	15,780	96	26	34
N6IFW	"	8,924	74	18	28
W6OVO	"	4,387	82	19	36
K6AW	**21**	**400,040**	**1162**	**33**	**113**
W6BSY	"	246,272	732	31	97
NJ6P	"	201,696	559	32	100
N6WR	14	33,321	146	32	55
W7CB/6	**7**	**32,508**	**152**	**28**	**56**
N6HY	"	8,950	71	18	32
W6KW	**3.7**	**102,717**	**405**	**33**	**68**
N6RO	**1.8**	**2,314**	**147**	**11**	**15**
***WA7BNM /6**	**A**	**1,097,250**	**1033**	**120**	**279**
***N6JM**	**"**	**374,214**	**488**	**93**	**189**
***W6QEU**	**"**	**364,140**	**469**	**103**	**186**
*K6UM	"	300,690	440	92	165
*W6VM	"	201,708	301	84	150
*W6PLJ	"	200,194	369	77	122
*W6KY	"	189,431	380	71	116
*KQ6QW	"	172,746	417	64	125
*W6SA	"	128,466	320	66	96
*K7JJ/6	"	118,184	291	65	93
*AA6EE	"	108,420	284	52	87
*N6ATD	"	98,943	205	64	113
*KC6AWX	"	43,952	246	36	46
*W6ND	"	34,216	115	45	59
*KO6DJ	"	33,558	168	42	52
*AD6EN	"	23,520	108	40	58
*AA6PW	"	23,119	173	27	34
*W6RFF	"	12,672	82	26	46
*AB6SO	"	2,001	26	15	14
*N6TPT	"	697	20	8	9
*K6DB	"	270	10	4	5
***K6KAY**	**28**	**185,334**	**699**	**29**	**73**
***K6RO**	**"**	**174,832**	**594**	**28**	**84**
*K6LA	"	108,150	403	29	76
*AC6WD	"	94,500	383	26	74
*WB6MBF	"	82,770	351	24	65
*N6RER	"	75,258	389	22	52
*NP4IW /W6	"	74,536	460	25	52
*WA6FGV	"	66,898	288	22	61
*KF6JFG	"	43,503	310	21	30
*KF6GUH	"	42,997	272	23	50
*K6LLQ	"	31,620	160	23	45
*K2PLF/6	"	21,784	138	18	38
*KF6DBW	"	19,840	113	20	44
*K6TUJ	"	5,658	56	17	24
*KF6OBS	"	5,208	62	16	26
***KU6T**	**21**	**49,677**	**216**	**24**	**63**
***KQ6ES**	**7**	**7,014**	**70**	**17**	**25**
W7AT	**A**	**2,838,786**	**2226**	**143**	**331**
W7GG	**"**	**2,512,806**	**2268**	**138**	**300**
K7RI	**"**	**2,150,582**	**2109**	**120**	**286**
N7TT	"	2,082,483	1669	133	326
W7VJ	"	1,030,324	1135	101	257
NØAH/7	"	497,280	742	92	204
N7RO	"	450,240	734	66	158
W7KKR	"	377,338	459	93	206
KM7TM	"	361,822	517	95	167
K7NPN	"	327,450	570	67	155
W7LGG	"	298,395	417	87	198
W7QN	"	280,042	479	79	162
K7GJ	"	261,870	391	85	173
KC7UP	"	254,968	441	68	164
K6TIM/7	"	192,168	318	99	215
NF7E	"	184,458	324	77	136
W7YS	"	141,510	336	61	117
KJ7CU	"	138,976	330	59	113
W7WK	"	127,380	258	58	135
K7RAT	"	124,057	344	52	79

AA7A	*	119,964	287	43	113
KA7TDH	*	119,250	275	52	107
KS7T	*	115,710	278	45	100
K7NO	*	112,085	295	44	101
N7JXS	*	74,620	201	56	84
W7ST	*	71,070	188	58	80
KE7RT	*	61,074	210	47	70
W7LBN	*	35,298	200	84	121
KI7ZE	*	22,149	82	45	62
KC7SSN	*	11,275	77	26	29
KI7LS	*	4,897	54	26	33
N7RT	**28**	**243,072**	**697**	**31**	**97**
K7CAR	*	103,596	429	27	62
W7EB	*	99,120	459	25	59
W7AYY	*	42,411	226	20	47
KJ7WK	*	16,176	123	18	30
W7UPF	**21**	**120,226**	**361**	**32**	**103**
W7IC	*	89,466	367	27	84
W7WA	**14**	**781,440**	**1538**	**39**	**146**
W7IL	**"**	**310,288**	**726**	**38**	**126**
AD7U	*	92,434	355	31	82
K7EM	**7**	**354,148**	**891**	**34**	**108**
W8AEF/7	3.7	18,836	142	24	44
K7ZZZ	*	6,950	59	20	30
***K7ZZ**	**A**	**555,124**	**758**	**84**	**190**
***K7HBN**	**"**	**519,414**	**644**	**93**	**205**
***KJ7TH**	**"**	**467,575**	**539**	**101**	**216**
*WN7J	*	460,653	570	100	191
*N7IR	*	304,325	435	88	171
*N7UJJ	*	294,508	491	78	166
*AB7RW	*	133,734	281	66	120
*W7LAR	*	71,604	226	40	77
*W7BJB	*	69,483	206	55	104
*KC7ZRH	*	56,406	199	43	76
*AB7II	*	42,360	141	49	71
*KW7N	*	41,776	161	43	69
*KC5AC/7	*	34,740	162	34	56
*N7MOK	*	27,580	145	28	42
*WA2OCG/7	*	18,630	118	20	34
*WU9B/7	*	14,628	103	27	42
*W7GTO	*	2,080	24	15	17
***K7JA**	**28**	**244,976**	**743**	**32**	**90**
*W7USA	*	117,611	401	27	82
*W7ILH	*	29,920	163	21	47
*KB7KLU	*	13,915	111	20	35
*W7DIF	*	5,986	57	17	24
*K7KGB	*	5,724	43	17	36
*K7JVT	*	4,770	90	19	34
***N7RQ**	**21**	**84,843**	**353**	**25**	**74**
*K7CW	*	41,919	194	28	61
*NN7A	*	13,275	86	19	40
*KA7FEF	*	6,204	72	11	22
***W7FP**	**14**	**130,739**	**352**	**32**	**101**
***KG7RZ**	**"**	**44,986**	**190**	**27**	**63**
W8PT	**A**	**672,980**	**707**	**102**	**278**
KE8GG	**"**	**668,099**	**712**	**93**	**266**
WB8TLI	**"**	**586,170**	**637**	**91**	**243**
K5IID/8	*	581,046	659	85	254
K2UOP/8	*	576,020	612	90	257
K8MR	*	567,853	591	95	266
KD8SQ	*	453,776	608	80	236
N8MZ	*	298,245	431	83	212
KC8KE	*	279,006	428	75	198
AA8PA	*	278,320	430	81	203
WD8JLM	*	260,026	412	74	200
K8RS	*	218,356	397	90	226
K8WT	*	207,480	329	71	176
K8PYD	*	193,952	361	59	150
W8FAX	*	189,886	319	76	187
N8GZE	*	168,672	383	61	163
W8WWC	*	127,379	268	65	152
N4ZR/8	*	120,888	240	49	135
K8CV	*	107,670	230	54	131
WT8P	*	88,008	278	41	111
K6VWE/8	*	83,667	231	52	115
KG8CW	*	71,680	170	55	105
K8VUS	*	50,274	157	45	81
WA8RSA	*	20,600	105	38	65
N8II	**28**	**286,520**	**724**	**29**	**123**
K5ZG/8	*	26,640	136	21	53
N8XWO	*	21,840	145	19	51
W8CO	*	21,582	121	21	45
WZ8T	**21**	**175,247**	**475**	**31**	**115**
W8LR	*	142,002	417	28	110
W8JGU	**14**	**189,497**	**446**	**38**	**123**
W8TWA	*	161,272	395	34	118
W8SJU	*	48,639	202	19	74
W8LRL	**1.8**	**6,496**	**71**	**16**	**40**
K8SM	*	465	20	6	9
***K8EP**	**A**	**319,092**	**495**	**72**	**196**
***KI8CS**	**"**	**298,680**	**434**	**73**	**189**
***K8LY**	**"**	**232,606**	**380**	**58**	**160**
*N8YYS	*	170,258	344	59	159
*AA8VG	*	157,358	289	66	136
*N8FWA	*	156,952	342	57	127
*K8AB	*	97,125	236	53	122
*AA8UP	*	69,258	150	67	127
*W8VE	*	61,830	202	45	90
*N4SEA/8	*	61,152	198	24	88
*W8TTS	*	26,983	112	43	78
*N8WTH	*	21,240	91	34	56
*AA8SN	*	14,131	136	34	65
*NS8O	*	12,166	91	27	50
*KC8HWV	*	11,692	81	25	49
*N8WS	*	7,410	50	19	38
*W8IDM	*	4,558	37	23	30
*WA8YLZ	*	554	20	11	13
***KF8K**	**21**	**168,635**	**432**	**30**	**115**
***N6WLX/8**	**"**	**158,485**	**407**	**32**	**113**
***NW7Q/8**	**"**	**132,616**	**383**	**30**	**107**
*KA8WQL	*	28,566	132	19	55
*AF8C	14	27,552	131	22	60
W9RE	**A**	**3,588,312**	**2090**	**156**	**495**
WB9Z	**"**	**3,028,104**	**1814**	**165**	**483**
K9BGL	**"**	**1,414,992**	**1152**	**133**	**359**
W9OP	*	881,790	814	100	299
K9CAN	*	713,868	650	105	299
KI9A	*	546,120	649	104	266
K9HUH	*	345,943	477	93	206
WA9TPQ	*	328,856	451	85	211
K9UQN	*	322,650	486	60	179
W9BCV	*	246,048	415	75	189
N9LCR	*	187,920	328	67	165
W9RN	*	142,437	228	85	152
N9STL	*	136,771	268	79	154
WB9LRK	*	72,747	209	43	94
KF9YR	*	30,444	104	47	71
KB9KEG	*	26,877	130	35	58
N9WKW	*	24,240	102	35	66
KE9EX	*	2,585	40	15	32
W9GIL	**28**	**85,012**	**289**	**27**	**79**
K9IG	**21**	**243,474**	**585**	**34**	**120**
W9OF	*	221,564	499	33	131
N9VVS	*	43,741	212	19	64
			(Opr. N9VVV)		
K9YNF	**14**	**87,075**	**264**	**31**	**98**
KD9DX	**7**	**25,270**	**114**	**23**	**72**
K9SH	*	16,646	77	23	59
***N9SXT**	**A**	**449,668**	**631**	**82**	**234**
***K9RN/M**	**"**	**400,400**	**508**	**71**	**204**
***W9GG**	**"**	**296,856**	**451**	**69**	**197**
*K9OP	*	156,849	264	78	153
*K9QVB	*	136,525	374	60	155
*AA9TB	*	128,526	301	55	131
*K9YAX	*	105,792	220	58	116
*N9WQ	*	83,476	193	57	107
*KJ9C	*	56,650	218	30	73
*K9WX	*	51,766	167	51	92
*N9GUN	*	46,515	170	27	78
*W9YS	*	46,053	158	43	76
*N9NW	*	30,368	116	40	64
*KB9SGP	*	12,446	108	39	59
*KB9LIE	*	9,295	62	26	39
*AF9J	*	4,094	25	21	25
*WA9LKZ	*	3,124	34	19	25
*KB9PQV	*	2,799	132	14	19
*KG9DU	*	5,000	43	21	29
***WO9S**	**28**	**113,256**	**360**	**27**	**90**
*KF9WM	*	25,500	142	19	49
*KB9JLW	*	11,050	111	14	36
***K9AB**	**21**	**56,100**	**196**	**24**	**78**
*KF9VJ	*	22,320	123	21	51
*AA9VH/M	*	12,900	99	17	33
***W9LYN**	**3.7**	**2,871**	**46**	**10**	**19**
N2IC/Ø	**A**	**3,777,672**	**2336**	**155**	**436**
KØRF	**"**	**2,926,228**	**2063**	**149**	**405**
WØGG	**"**	**1,037,562**	**995**	**116**	**286**
WØMW	*	626,640	667	108	265
KMØL	*	573,770	774	106	256
K9MWM/Ø	*	441,738	679	100	191
KØGAS	*	269,323	450	87	164
KØIL	*	257,136	396	83	181
WØTT	*	243,144	463	86	178
KØIW	*	211,084	414	82	144
WØYA	*	124,729	248	55	132
WØPPF	*	107,901	242	55	116
KBØKRO	*	103,514	266	45	101
KØDAT	*	102,209	218	54	125
KØXD	*	90,720	247	62	118
KØFG	*	87,785	195	56	125
KØRY	*	86,352	222	55	113
AAØAI	*	46,978	124	56	110
NØRUV	*	29,952	125	41	55
WØRXL	*	27,702	100	43	71
ADØH	*	27,572	113	45	68
WXØU	*	26,877	107	34	59
KSØM	*	26,606	101	40	66
KBØZZL	*	24,416	200	39	73
KCØCOP	*	7,009	74	20	23
K1KI/Ø	*	3,397	38	17	26
KAØWBP	*	2,040	58	23	28
KØKE	**28**	**304,569**	**863**	**30**	**99**
KØRS	*	167,649	536	30	93
KKØSS	*	155,610	422	30	100
N7DR/Ø	*	115,488	433	27	69
NØVAO	*	10,665	85	17	28
WØAJ	*	3,131	51	12	19
WØUN	**21**	**720,954**	**1625**	**36**	**133**
			(Opr. WØUA)		
NØNR	**"**	**544,893**	**1432**	**34**	**115**
WØRA	*	177,117	632	31	98
NØUU	*	44,448	192	25	71
KVØQ	**7**	**280,462**	**752**	**33**	**101**
KØJPL	*	2,160	26	14	22
KØGT	**3.7**	**15,387**	**92**	**19**	**50**
KØCS	**1.8**	**1,188**	**35**	**8**	**14**
***ACØW**	**A**	**882,234**	**869**	**112**	**302**
***KAØWWT**	**"**	**331,002**	**493**	**77**	**182**
***K2HT/Ø**	**"**	**115,692**	**219**	**77**	**135**
*KBØENE	*	99,372	230	51	118
*KØGJX	*	92,105	217	56	113
*WAØDCB	*	61,963	181	43	88
*KIØLF	*	61,016	200	48	68
*KR6NA/Ø	*	56,025	211	47	88
*WBØB	*	29,484	146	30	48
*KBØWPY	*	28,747	131	35	54
*WBØIEL	*	27,390	108	38	72
*N1YJD/Ø	*	22,880	117	37	67
*KBØPPA	*	15,750	97	33	57
*KBØVVT	*	14,664	133	40	54
*KØTPY	*	3,956	40	15	28
*NØLER	*	145	10	5	5
*NØFCK	*	17	5	4	4
*KØRX	28	9,850	77	15	35
*AAØXJ	"	2,660	32	13	22
***AAØTY**	**21**	**76,627**	**279**	**24**	**85**

ALASKA

KL7AC	**A**	**772,310**	**1270**	**75**	**163**
NL7Z	**"**	**734,491**	**1600**	**80**	**131**
WL7KY	*	530,511	1331	65	116
KL7RA	**7**	**93,415**	**475**	**26**	**59**
***KL1R**	**A**	**125,775**	**491**	**52**	**71**
*WA2GO /KL7	*	31,964	225	27	34
*KL7FAP	7	24	2	2	2

ANGUILLA

***VP2EJR**	**A**	**244,630**	**776**	**61**	**109**
			(Opr. W1EK)		

BARBADOS

8P9V	**A**	**6,493,809**	**4885**	**133**	**440**
			(Opr. OH6RX)		

BELIZE

***V31JU**	**28**	**258,840**	**2064**	**22**	**38**
***V31MX**	**21**	**433,704**	**1912**	**23**	**79**

BERMUDA

VP9NF	A	54,768	208	35	77

BRITISH VIRGIN ISLANDS

***VP2VF**	**28**	**841,920**	**3379**	**27**	**93**

CANADA

VE1JX	**A**	**2,870,952**	**2473**	**112**	**371**
			(Opr. K6HNZ)		
VO1WET	**"**	**1,570,602**	**1998**	**75**	**243**
VE1ZJ	*	1,543,850	1542	94	307
VE9XA	*	190,635	429	64	149
VE1BY	**1.8**	**148,798**	**806**	**21**	**76**
			(Opr. K3BU)		
***VO1IMB**	**A**	**400,824**	**748**	**59**	**169**
*VE9KM	*	213,200	422	56	149
*VO1RE	*	2,100	30	11	19
***VO1SO**	**28**	**78,496**	**369**	**23**	**65**
VE2AYU	**A**	**865,917**	**1143**	**86**	**265**
VE2AWR	**"**	**350,548**	**592**	**71**	**186**
VA2MP	*	38,610	127	43	87
VE2BOB	*	28,980	145	38	67
VA2AM	*	18,094	94	39	70
VE2ZDR	*	8,064	70	23	41
VA2BY	**3.7**	**53,320**	**802**	**12**	**28**
VA2DO	**1.8**	**12,789**	**334**	**8**	**13**
***VE2GSO**	**A**	**546,096**	**1354**	**55**	**131**
*VE2AE	*	437,320	895	64	168
*VE2GWL	*	94,696	249	50	102
***VE2BWL**	**21**	**99,450**	**301**	**26**	**91**
***VE3RHJ/214**		**28,665**	**459**	**12**	**23**
VE3XN	**A**	**1,340,180**	**1753**	**88**	**270**
VE3AT	**"**	**1,334,377**	**1689**	**75**	**244**
VE3KPU	*	693,720	933	88	240
VE3WIB	*	520,128	724	69	219
VA3KA	**28**	**310,821**	**997**	**28**	**105**
VE3ZT	*	63,420	282	24	81
VE3KZ	**21**	**764,196**	**1757**	**35**	**137**
VA3MG	**"**	**694,650**	**1826**	**32**	**133**
VE3UZ	*	30,272	133	24	64
VA3MM	**14**	**663,600**	**1661**	**35**	**133**
VE3RM	*	413,718	1062	37	122
***VE3OTL**	**A**	**647,962**	**971**	**85**	**227**
*VE3STT	*	444,935	644	69	196
*VE3EL	*	299,112	508	71	171
*VA3SWG	*	224,802	756	56	125
*VE3ZZ	*	223,872	419	60	152
*VA3JFF	*	191,520	360	69	155
***VE3SRE**	**28**	**114,170**	**512**	**25**	**73**
*VE3NBE	*	15,180	96	15	40
VE4RP	A	55,106	202	47	71
*VE4JEG	A	36,520	212	35	53
VE5AAD	**21**	**62,238**	**436**	**22**	**44**
***VE6BF**	**A**	**206,040**	**422**	**68**	**136**
***VE6BMX**	**28**	**58,630**	**529**	**20**	**35**
VE7IN	**A**	**1,462,734**	**2198**	**95**	**187**
VE7NS	*	435,240	775	79	137
VE7SCC	*	255,780	875	64	110
VE7XO	*	254,282	474	60	126
VE7NKI	**21**	**197,824**	**1004**	**25**	**63**
VE7XR	**14**	**736,980**	**1816**	**40**	**133**
***XL7A**	**A**	**3,513,342**	**3050**	**140**	**343**
			(Opr. VE7SV)		
*VE7TLK	*	452,350	1059	77	141
*VE7CI	*	98,154	350	51	72
***VE7GFS**	**28**	**189,486**	**948**	**24**	**63**
***XO7X**	**21**	**382,004**	**1664**	**28**	**70**
			(Opr. VE7AHA)		
*VE7ABC	*	110,700	631	26	56

CAYMAN ISLANDS

ZF2DR	**14**	**859,880**	**3012**	**34**	**106**
			(Opr. K5RQ)		

COSTA RICA

TI7DBS	**21**	**425,703**	**1482**	**27**	**96**

CUBA

***CO8DC**	**A**	**650,090**	**1171**	**75**	**176**
*CO8JC	*	21,359	155	12	41
*CO6QK	*	2,345	25	15	20

EL SALVADOR

***YS1RR**	**A**	**2,761,850**	**2938**	**122**	**333**

HONDURAS

HR1JPT	**A**	**133,198**	**1125**	**36**	**58**
***HR6 /VE3BW**	**28**	**419,520**	**2166**	**25**	**70**

MEXICO

XE1MX	**A**	**483,375**	**2198**	**51**	**67**
XE3LMV	**"**	**428,260**	**1088**	**79**	**117**
***XE2MX**	**A**	**135,450**	**341**	**67**	**118**
*XE1RGL	*	47,912	201	47	59
***XE2DV**	**28**	**1,052,625**	**3759**	**32**	**93**
*XE1FES	*	417,560	1829	30	80
*XE1EZM	*	270,800	1362	28	72
*XE2AUB	*	108,962	678	28	58
***XE1CRO**	**21**	**255,136**	**989**	**30**	**89**
*4B1FEC	*	146,336	1115	24	44
			(Opr. XE1BEF)		

PANAMA

***HO3A**	**A**	**351,393**	**793**	**68**	**135**
			(Opr. HP3XUG)		
***HP1DGX**	**28**	**66,732**	**625**	**16**	**51**
***HP1BYS**	**14**	**97,875**	**496**	**23**	**64**

PUERTO RICO

***WP4LNY**	**A**	**264,496**	**988**	**39**	**83**

ST. KITTS & NEVIS

V47KP	**A**	**3,273,360**	**3227**	**108**	**352**
			(Opr. W2OX)		
V47NS	**28**	**817,935**	**2045**	**31**	**124**
			(Opr. W9NY)		

ST. LUCIA

***J6/K3LP**	**A**	**2,221,698**	**2796**	**92**	**287**

SAINT MARTEN

PJ8Z	**A**	**8,591,520**	**6756**	**127**	**433**
			(Opr. K4ZA)		

U.S. VIRGIN ISLANDS

***NP2DJ**	**A**	**56,648**	**250**	**37**	**60**

AFRICA

AFRICAN ITALY

IG9T	28	33,225	153	24	51
IG9T	**21**	**1,381,908**	**2765**	**36**	**138**
			(Opr. I2VXJ)		
IG9T	14	118,565	350	26	89
IG9T	**7**	**973,782**	**2128**	**32**	**13**
			(Opr. IV3TAN)		
IG9T	**3.7**	**473,594**	**1393**	**25**	**96**
			(Opr.IT9EQO)		
IG9T	**1.8**	**113,022**	**561**	**12**	**66**
			(Opr. IV3OWC)		

ASCENSION ISLAND

ZD8Z	**A**	**13,715,460**	**6990**	**157**	**503**
			(Opr. N6TJ)		
***ZD8T**	**A**	**729,312**	**1186**	**69**	**144**
			(Opr. AC4IV)		

CANARY ISLANDS

EA8AH	**A**	**15,277,596**	**7727**	**161**	**542**
			(Opr. OH1RY)		
EA8AOD	*	70,378	193	43	111
***EA8AG**	**A**	**2,072,406**	**1893**	**95**	**276**
*EA8AD	*	464,224	1118	48	115
***EA8AEI**	**28**	**145,368**	**469**	**28**	**80**
***EA8BXQ**	**21**	**134,229**	**487**	**20**	**81**

CENTRAL AFRICA

TL5A	**21**	**2,211,366**	**3685**	**39**	**174**
			(Opr. PA3DZN)		
***TL8MS**	**A**	**906,298**	**1172**	**69**	**194**

CEUTA & MELILLA

EA9AM	**A**	**8,749,164**	**5074**	**132**	**459**
			(Opr. K6NA)		
***EA9 /EA7RU**	**A**	**772,260**	**1234**	**51**	**160**
*EA9AR	*	546,700	678	72	236

EGYPT

SU2MT	**A**	**11,805,734**	**6472**	**138**	**488**
			(Opr. CT1BOH)		
*SU3YM	*	5,628	67	7	21

ERITREA

***E31AA**	**A**	**2,589,816**	**2584**	**87**	**279**
			(Opr. F2CW)		

GHANA

9G5BO	14	782	19	8	9
***9G1BJ**	**28**	**1,458,044**	**2912**	**36**	**137**
***9G1YR**	**21**	**310,996**	**907**	**25**	**91**

LIBYA

***5A1A**	**A**	**447,076**	**775**	**53**	**143**

MALI

TZ6DX	**28**	**835,401**	**1987**	**30**	**117**
			(Opr. K4RB)		

MADEIRA ISLANDS

CT3BX	**14**	**1,279,785**	**2433**	**38**	**157**
			(Opr. TF3CW)		
CT3HG	*	665,808	1621	35	108
***CT3DZ**	**21**	**866,392**	**2017**	**32**	**116**

MOROCCO

CN8WW	**A**	**15,375,060**	**7702**	**143**	**544**
			(Opr. DL6FBL)		
CN8NK	21	248,285	794	25	90

NAMIBIA

***V51SG**	**A**	**743,130**	**1207**	**68**	**162**

NIGERIA

***5N7YZC**	**A**	**182,085**	**327**	**57**	**142**
			(Opr. N9MDW)		
***OK1AUT /5NØ**	**21**	**1,590,300**	**2974**	**35**	**155**

REUNION

*FR/DL5JMN	A	28,714	115	30	68

SENEGAL

6V1C	**28**	**1,623,378**	**3458**	**32**	**142**
			(Opr. 6W1QV)		

SOUTH AFRICA

ZS6BXN	**A**	**2,529,660**	**2497**	**102**	**278**
ZS1ESC	*	886,697	1526	49	148
ZS4BS	*	2,108	24	14	17
ZS5BBO	**14**	**537,451**	**1431**	**34**	**103**
ZS6EZ	**3.7**	**13,298**	**75**	**23**	**38**
***ZS6PHD**	**A**	**341,649**	**645**	**61**	**126**

TUNISIA

3V8BB	**A**	**10,881,440**	**5169**	**162**	**590**
			(Opr. YT1AD)		

UGANDA

5X1T	**28**	**2,501,521**	**4133**	**37**	**172**
			(Opr. ON6TT)		
***5X1Z**	**21**	**1,084,671**	**2037**	**37**	**152**
			(Opr. SM7PKK)		

ZAMBIA

9J2FR	**A**	**2,749,110**	**2908**	**81**	**237**
9J2A	**21**	**3,043,872**	**5411**	**40**	**168**
			(Opr. JAØJHA)		

ZIMBABWE

Z21CS	**28**	**167,664**	**513**	**29**	**83**

ASIA

ARMENIA

***EK6CC**	**A**	**1,516,000**	**1478**	**101**	**278**
*EK4JJ	*	11,858	55	30	47

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ASIATIC TURKEY

*YM75ROT	A	425,587	714	52	159
			(Opr. TA3BN)		
*TA8J	*	23,970	94	31	63
*TA3YJ	28	63,765	348	15	50
*TA3D	21	660,136	1833	34	118
*YM75TA	3.7	88,200	473	11	59
			(Opr. TA3J)		

ASIATIC RUSSIA

UA9KJ	A	900,694	1245	99	252
UA9KM	"	319,464	553	82	179
UA9MR	*	187,452	324	66	180
UA9CKS	*	178,200	388	61	159
UA9JDP	*	170,570	512	44	141
RZ9UR	*	85,904	198	59	123
UA9OC	*	84,744	213	67	131
UA9SNQ	*	42,817	263	25	89
UA9OSV	*	14,256	113	23	43
UA9XEN	*	9,656	68	30	41
RX9SX	*	3,450	29	21	29
RW9SW	28	73,332	385	26	71
RK9JWV	*	12,650	239	18	32
RA9JP	21	154,500	772	30	95
RZ9UA	14	1,211,679	2554	40	149
RA9DZ	*	247,066	767	31	100
RX9FG	*	75,680	318	20	68
RA9FEU	*	4,880	53	10	30
*RW9HA	A	606,698	933	82	212
*RW9QA	"	364,095	573	64	197
*RA9AC	*	229,614	481	59	172
*RK9UM	*	228,690	414	85	185
*RN9XA	*	166,049	341	74	167
*RW9RF	*	94,642	275	45	113
*RA9AUH	*	89,046	224	39	114
*RA9UAP	*	33,172	209	22	54
*UA9OJG	*	18,907	170	22	51
*UA9SBC	*	7,952	69	18	38
*RA9FF	21	45,984	212	22	74
*RJ9J	14	377,937	1238	33	114
			(Opr. RA9JR)		
*UA9BS	*	142,440	498	29	91
*UA9MAZ	*	122,879	519	31	74
*RZ9CX	*	38,304	209	17	59
*UA9JLJ	3.7	42,930	314	16	65
*UA9ACJ	*	33,600	206	12	52
RNØA	A	135,293	319	54	139
			(Opr. UAØAGI)		
UAØLH	*	87,406	245	48	79
RAØAM	*	67,200	249	64	96
UAØSR	*	54,896	203	52	94
UAØBGZ	*	28,770	155	41	64
UAØCW	*	13,524	61	40	58
RAØBA	28	23,856	227	25	46
RAØCG	3.7	61,650	380	27	63
RAØSA	*	4,725	79	15	30
*UAØJH	A	972,036	2023	118	254
*UAØSJ	"	585,620	1041	98	231
*UAØYAY	*	344,311	568	77	200
*UAØDC	*	114,121	439	55	82
*RUØAT	*	73,600	277	45	115
*UAØJDD	*	33,000	215	38	62
*RAØCL	*	11,466	122	27	36
*UAØAPP	*	1,976	39	16	22
*UAØZBK/Ø28		98,455	505	35	62

AZERBAIJAN

4J9RI	A	2,087,072	1808	94	322
*4K9W	A	9,875	67	30	49
*4KA6GF	28	60,505	305	17	50

CHINA

*BD4DW	28	99,840	502	33	63

CYPRUS

C4A	A	9,781,930	5105	146	548
			(Opr. 5B4ADA)		
C4W	A	8,287,995	4670	149	524
			(Opr. 5B4WN)		
5B4AGC	21	1,551,539	3095	35	152
5B4 /NP3D	3.7	250,416	933	21	90
*5B4 /EW1AR	28	889,956	2123	36	141

GEORGIA

*4L1UN	14	67,071	299	20	59
*4L5O	3.7	146,316	663	15	74

HONG KONG

VR2KF	A	512,727	961	84	193
VR98BG	21	795,511	2756	36	113
VR98BG	1.8	0	1	1	1

INDIA

*ATØMB	A	803,665	1069	88	247

ISRAEL

4Z1GY	A	979,618	1200	66	196
4X4DZ	28	1,065,600	2933	34	126
4X6ZK	"	1,025,024	2238	37	145
4X/OK1TD	21	656,370	1431	33	132
*4XØF	A	1,412,545	1501	84	271
			(Opr. 4Z5FL)		
*4XØT	"	974,283	1230	58	209
			(Opr. 4Z5FI)		
*4Z5JQ	*	147,576	319	50	122
*4X/TF1MM	*	58,116	231	24	63
*4X1VF	28	904,639	2155	33	134
*4X6DK	*	128,472	457	26	75
*4Z5FW	21	75,036	500	18	34
*4X1KS	*	3,984	44	14	34

JAPAN

JM1XCW	A	1,720,383	1919	113	244
JF1OPL	"	722,466	864	104	202
JR1LEV	*	410,080	634	82	151
JA1QOW	*	199,977	418	69	122
JA1HP	*	190,992	404	63	121
JA1BPN	*	75,325	219	54	77
JH1CTV	*	71,071	215	51	92
JA1ANA	*	47,190	138	60	70
JA1XPU	*	13,860	82	29	48
JA1KK	*	12,096	76	24	39
JH1FSF	28	101,230	396	33	73
JH1UUT	*	47,748	262	23	46
JS1KQQ	*	27,066	143	28	50
JA1IFB	*	1,368	26	9	9
JE1LFX	21	382,181	995	37	114
JA1YBK	*	267,402	799	33	90
			(Opr. JL1WFD)		
JR1MQT	*	221,052	723	33	76
JK1OXU	*	142,154	468	33	80
JI1FDF	*	25,365	267	29	66
7L1GVE	14	909,144	1797	38	145
JA1KAL	*	9,360	83	20	28
JH1RFM	7	68,112	330	30	69
*JL1ARF	A	1,238,204	1158	131	297
*JJ1VRO	"	755,001	833	112	239
*7L4IOU	"	566,060	741	102	208
*JS1OYN	*	505,272	706	105	191
*JH1OAI	*	362,600	502	99	181
*JA1BUI	*	301,250	455	92	158
*7J1ABD	*	272,835	427	84	151
			(Opr. WA6URY)		
*JE1UFF	*	195,775	382	72	119
*JR1MRG	*	190,890	412	66	123
*JG1TVK	*	175,440	307	76	139
*7K4GUR	*	154,190	341	57	113
*JE8KKX/1	*	137,412	262	76	122
*JR1SGU	*	128,304	305	65	111
*JM1NOQ	*	128,040	290	63	102
*JA1AB	*	75,096	228	46	80
*JA1HFY	*	66,048	204	48	81
*JK1ATT	*	63,024	194	59	97
*JA1XUY	*	59,605	183	52	79
*JR3PZW/1	*	45,288	146	56	92
*JG3NKP/1	*	40,020	126	44	71
*JH1WOW	*	36,936	150	39	69
*JH1OLB	*	34,776	149	36	56
*JQ1ABC	*	29,859	109	46	65
*7K4XVK	*	18,395	109	26	39
*JR1LQK	*	10,472	69	29	39
*7N2JFU	*	6,744	67	15	24
*JH1RMH	*	3,600	36	18	18
*JP1PQD	*	875	15	11	14
*JR1BTG	28	143,676	573	32	66
*JF1RPZ	*	31,725	191	29	46
*JHØALB/1	*	22,287	148	21	36
*7N2UQC	*	12,810	109	24	37
*JH1CML	*	11,424	90	18	30
*JA1EEG	*	10,829	85	18	31
*JG1OWV	*	10,701	96	17	24
*JA1AAT	*	8,820	70	18	27
*JA1XRH	*	4,960	52	16	24
*JE1HXZ	*	1,890	30	8	13
*7K2PBB	*	722	16	7	12
*7M3RMD	*	431	11	7	6
*7K1EQG	*	377	17	6	7
*JL1MWI	21	60,984	251	32	68
*JG1JQJ	*	33,616	202	28	60
*7K2GNK	*	19,803	114	20	49
*JI1DGP	*	17,346	104	19	40
*JA1NQU	*	14,592	86	21	43
*JH4ARK/1	*	14,400	100	18	30
*JA1EJD	*	14,035	93	22	36
*JG1GCO	*	11,060	64	24	46
*JA1JLP	*	9,798	71	16	30
*JK1BII	*	8,918	73	18	31
*JL2HUJ/1	*	4,216	56	13	21
*7M1QYH	*	3,990	44	13	22
*JE1WSC	*	3,201	41	13	20
*JH1KZQ/1	*	2,560	44	12	15
*7M1TCV	*	1,053	17	9	13
*JQ1AHZ	*	560	17	8	8
*JR1BSV	*	528	13	6	10
*JR4PMX/1	14	202,340	522	36	115
*JA1BBA	*	22,896	122	25	47
*JF1LQP	*	11,310	81	20	38
*JO1RGV	*	8,789	73	21	26
*JM3UAO/1	*	3,094	33	13	21
*JH1TUX	*	1,197	27	10	11
*JO1TLP	*	504	12	5	9
*JG1FGL	*	350	15	5	9
*JK1LUY	*	260	11	6	7
*JR1TMI	7	99	11	2	1
*JH1RDU	*	18	3	1	1
*JE1SPY	3.7	940	23	8	12
JA2BNN	A	922,610	1186	113	197
JH2AMH	"	247,520	497	80	144
JH2AQI	*	213,279	334	84	169
JA2FSM	*	179,452	338	72	131
JA2QVP	*	14,857	69	33	50
JE2LUN	28	67,200	237	37	75
JS2LGN	21	635,400	1668	35	115
JA2CWU	*	6,762	55	21	28
*JK2VOC	A	201,528	457	71	145
*JA2OJ	"	115,624	286	51	98
*JA2GHP	*	83,006	276	40	81
*JG2REJ	*	66,920	196	51	89
*JA2BEY	*	65,018	218	42	76
*JG2CNZ	*	31,108	124	42	59
*JH2IJC	*	21,870	100	35	46
*JH2WHS	*	19,602	97	27	54
*JA2BHJ	*	15,752	129	38	50
*JA2BLJ	*	14,208	96	26	48
*JJ2TKX	*	9,024	62	28	36
*JA2RFG	*	3,240	62	21	31
*JJ2IER	*	592	15	7	9
*JG2VSF	28	6,380	57	16	28
*JR2TRC	*	2,726	34	12	17
*JR2LIS	21	130,080	527	29	67
*JA2BQX	*	15,180	133	21	34
*JA2IZA	*	12,768	90	21	35
*JI2VLM	*	11,025	77	32	31
*JA2XOA	*	3,744	51	11	21
*JO2WIA/2	*	18	2	1	2
*JM2CCL	14	1,638	26	8	18
*JE2OTM	3.7	1,248	24	10	14
JS3CTQ	A	2,211,638	2041	122	285
JA3LDH	"	392,559	539	100	191
JR3WXA	*	281,970	445	83	158
JG3WCZ	*	192,045	342	82	135
JR3XEX	*	110,856	280	46	103
JA3ARM	*	35,143	120	44	69
JA3ORD	*	4,900	38	20	29
JI3OPA	28	421,165	1228	38	93
JA3ETD	*	29,413	167	25	42
JA3ZOH	21	497,408	1460	34	100
JR3CVO	*	10,537	92	19	22
*JH3CUL	A	354,025	535	95	194
*JA3UWB	"	205,725	371	60	135
*JF3PLF/3	*	176,595	389	62	121
*JH3TXP	*	33,155	127	37	58
*JJ3QXW	*	25,612	125	24	52
*JL3IVX	*	10,500	97	31	53
*JE3HHT	*	7,680	59	18	30
*JA3WFQ	*	3,840	45	16	24
*JH3AKD	28	7,821	84	12	21
*JR3ADB	*	6,048	60	14	28
*JA3IVU	*	5,625	51	16	29
*JJ3OOZ	*	3,952	42	14	24
*JR3RIY	21	311,328	846	34	107
*JL3VUL/3	"	267,512	874	32	87
*JI3DST/3	*	208,336	662	31	85
*JA3LEZ	*	78,473	297	28	69
*JA3TC	*	48,459	218	26	61
*JA3BBG	*	27,229	142	23	50
*JJ3APB	*	15,512	121	20	36
*JF3IYW/3	*	8,150	77	18	32
*JL3RDC	*	7,904	67	18	34
*JR3CVJ	*	6,885	59	14	31
*JH3JZI	*	2,304	28	12	20
*JR3KAH	*	1,416	27	7	17
*JN3DSH	14	27,900	161	26	49
*JR3EOI/3	7	8,786	79	18	28
JH4ADK	A	978,193	1117	113	234
JA4XRN	"	296,103	402	92	175
JA4DHN	*	99,007	201	58	123
JA4HIX	*	50,140	156	44	71
JH4RHF	28	32,680	169	31	55
JL4DJM	*	24,120	142	28	44
JH4JNG	14	387,576	839	39	129
*JH4WBY	A	223,450	418	79	126
*JA4BAA	*	56,135	201	37	72
*JA4AQR	28	9,504	60	24	42
*JA4CTL	*	3,978	78	19	32
*JR4GPA	21	169,165	550	32	83
*JK4DBT	*	40,643	184	31	66
*JA4JJI	*	16,947	105	19	44
*JN4GHQ	*	463	11	6	8
*JE4QGF	14	13,475	104	20	35
*JM4WUZ	7	27,857	151	28	61
*JA4YPE	3.7	90	5	5	5
			(Opr. JF3EBO)		
JA5IP	A	63,736	193	47	77
JA5OVU	21	1,007,742	2285	37	122
JR5PWV	*	15,892	101	17	41
*JH5OXF	A	382,930	590	83	174
*JA5EO	"	310,662	573	67	131
*JA5APU	*	25,315	217	14	25
*JG5VIA	*	11,130	67	26	44
*JF5FGY	28	25,875	138	29	46
*JE5MCV	21	245,525	790	30	85
*JI5BKC	*	6,040	59	15	25
*JA5CUE	*	5,600	58	15	25
*JA5PDS	7	924	19	9	13
JA6WW	A	198,225	386	84	141
JR6EZE	28	574,145	1442	38	105
JA6WJL	*	263,480	716	36	104
JJ6DGP	*	37,840	173	28	52
JQ6NAW	7	53,088	250	26	58
JH6EJG	*	33,454	150	24	62
*JA6UBK	A	799,498	845	127	275
*JA6EML	"	404,054	580	84	182
*JA6CM	*	182,160	331	71	136
*JH6OPP	*	160,752	353	74	130
*JH6FTJ	*	76,516	197	50	98
*JH7IPR/6	*	36,569	147	36	61
*JA6QDU	*	35,947	135	36	67
*JA6AKV	*	24,948	117	39	60
*JA6PL	*	17,836	86	35	56
*JH6AAM	*	3,744	36	11	28
*JL6RNY	*	2,108	55	30	32
*JR7HOD/6	*	1,575	32	15	20
*JA6EFT	28	41,184	222	27	45
*JA6CBW	*	15,370	105	21	32
*JA6BIF	21	65,044	257	26	66
*JK6ISK	*	42,273	204	25	52
*JE6FPP	14	3,549	37	16	23
JA7BEW	A	1,504,128	1444	126	258
JA7IC	*	106,731	221	65	112
JJ7SRA	*	104,961	251	64	113
JH7DNO	21	782,420	1950	38	104
JA7FTR	14	493,890	1169	39	124
JH7LRS	7	87,936	345	30	66
*JR7WAB	A	789,519	1227	92	175
*JA7NVF	"	704,258	854	106	201
*JH7FUI	*	83,020	215	57	83
*JI7VUR	*	69,212	189	56	87
*JM7JMG	*	13,790	75	30	40
*JL7BRH	28	61,971	275	33	64
*JA7VEI	*	23,460	157	23	37
*JR7WFC	*	23,218	205	15	23
*JE7DOT	*	22,010	139	23	39
*JK7QYZ	*	10,500	94	15	27
*JA7ARW	*	5,760	58	16	29
*JH7NPF	21	169,668	582	33	75
*JR7LVK	*	42,476	196	29	53
*JE7KHL	*	36,024	166	29	50
*JA7ADV	*	8,450	67	22	28
*JL7XVL	*	1,426	34	16	25
*JI7NHE	*	700	17	9	11
*JM7EPG	*	14	42	12	21
JA8RWU	A	2,673,128	2209	140	312
JH8UQJ	28	3,948	36	22	25
JH8FAJ	21	12,238	81	23	35
*JA8JCR	A	400,400	567	99	176
*JA8TEZ	*	19,964	132	25	37
*JK8HOS	*	4,680	44	18	27
*JH8CFZ	28	17,948	209	32	60
*JH8QBY	*	8,275	111	11	14
*JA8DTJ	21	19,942	134	22	37
*JI8GZS	*	5,311	47	18	29
*JK8FRL	*	1,204	21	12	16
JA9JFO	21	289,432	856	33	88
JE9CYC	*	25,092	139	21	47
JA9IKL	*	21,483	131	23	40
*JH9ATT	A	73,530	208	50	79
*JA9KA	*	5,753	49	15	27
*JH9VSF/9	28	247,842	859	37	89
*JA1ALX/9	*	26,585	164	24	41
*JA9QOY	*	14,248	106	19	33
*JJ6VXY/9	*	810	18	7	11
*JR9NVB	21	119,238	365	36	86
*JA9REF	*	936	17	10	14
JAØQNJ	A	3,093,912	2657	140	303
JAØQWO	"	989,080	1238	101	215
JRØWZR	*	650,762	736	106	223
JAØUMV	*	534,835	689	108	187
JEØEHE	*	201,924	357	79	134
JHØGHZ	28	57,440	274	28	52
JAØFVU	21	8,064	79	17	31
JAØRCK	14	7,611	50	20	39
*JEØUXR	A	911,616	969	125	259
*JEØRHE	*	235,330	391	81	152
*JRØPJR	*	138,188	308	63	116
*JHØEOS	*	2,256	36	9	15
*JAØGZ	*	1,590	21	15	15
*JEØVFV	*	663	17	6	7
*JH1BXH/Ø	28	103,692	425	32	72
*JHØFUW	*	20,691	131	21	36
*JAØGEY	*	5,412	52	16	25
*JAØKJD	*	1,581	36	14	17
*JHØSGG	21	27,468	126	27	57
*JHØFWV	*	23,585	102	27	62
*JEØKAM	*	11,396	64	16	58
*JHØEPI	14	177,606	542	32	85
*JHØHON	*	5,226	48	10	29

JORDAN

JY9QJ	A	3,868,304	2841	114	382
*JY9NE	A	28,141	103	34	73
			(Opr. N3FNE)		

KAZAKHSTAN

UN2O	A	370,296	456	88	245
UN7TX	7	65,894	361	23	71
*UPØF	A	306,072	758	59	159
*UN7JX	28	102,399	446	27	80
*UN5PR	21	247,572	1125	32	106
*UN9DDX	*	55,125	308	20	55

KYRGYZSTAN

EX8W	A	4,020,525	3447	119	382
EXØY	28	241,536	921	37	101
EX8MDA	21	140,193	674	25	86
EX2T	7	44,280	225	17	65

KOREA

*HL1CG	A	186,580	375	61	129
*HL5YI	*	18,352	108	27	47

KUWAIT

9K2HN	A	5,331,053	3119	140	497
9K2ZZ	28	124,542	544	25	74

LEBANON

OD5NJ	A	372,970	695	45	145
*OD5PN	A	431,388	795	53	154

MACAO

*XX9AU	21	7,752	198	14	20

OGASAWARA ISLANDS

*JD1BIA	21	65,018	796	20	39

PAKISTAN

AP2N	A	1,056,794	1240	101	250
*AP2TJ	A	880,688	1244	80	224

TAIWAN

BV7FF	21	111,150	854	27	68

TAJIKISTAN

EY8MM	A	989,364	1318	92	256

THAILAND

HSØ /SM3DYU	A	21,978	71	47	64

TURKMENISTAN

EZ8CQ	21	52,160	305	17	47
*EZ8CW	A	53,955	186	35	64

UNITED ARAB EMIRATES

A61AC	A	5,424,530	3540	123	455
			(Opr. DL2CC)		

UZBEKISTAN

UKØA	A	3,296,262	2721	117	381
*UK8IG	21	54,648	263	22	66

VIETNAM

3W6US	A	538,450	1198	95	180
			(Opr. YBØUS)		
*XV7TH	21	72,847	385	29	68

WEST MALAYSIA

9M2TO	A	1,732,402	2367	118	288
			(Opr. JAØDMV)		
*9M2PS	A	268,370	698	79	156

EUROPE

ALAND ISLANDS

OHØZ	A	3,742,508	3891	138	500
			(Opr. OH1EH)		
OHØMM	14	843,081	2670	39	144
			(Opr. OH2MM)		

AUSTRIA

OE5BVM	A	154,008	538	44	80
OE6Z	21	1,053,032	2342	40	154
			(Opr. OE6MBG)		
OE1EMS	*	747,192	1768	38	153
*OE2S	A	954,840	1222	95	341
			(Opr. OE2GEN)		
*OE1JIS	*	44,588	193	42	100

AZORES

CU3AD	14	14,898	100	17	61
*CU2AF	28	143,172	707	22	75

BALEARIC ISLANDS

EA6AEQ	28	268,560	861	27	117
EA6LP	3.7	1,344	40	7	21
*EA6YW	A	104,196	244	64	164
*EA6PZ	*	73,008	206	46	110
*EA6GP	28	800	40	6	10
*EA6ACF	21	47,244	250	18	75
*EA6JN	*	13,488	115	13	35

BELARUS

EW2ØØM	A	663,136	1202	90	301
EU6AR	*	3,193	45	14	17
EW6AL	28	30,272	205	23	63
EU6DX	*	72	5	3	3

EU6TT	21	7,685	65	17	36
EW6TU	3.7	10,980	209	8	37
***EU1SA**	**A**	**286,500**	**588**	**76**	**224**
***EW6DF**	**28**	**34,365**	**288**	**19**	**60**
***EW6GB**	**21**	**33,282**	**261**	**15**	**84**
*EW1NA	"	30,788	173	21	65

BELGIUM

OT8T	**A**	**6,791,449**	**3478**	**163**	**670**
			(Opr. RA3AUU)		
ON4XG	"	199,989	457	53	190
ON4DPP	**14**	**512,856**	**1772**	**34**	**119**
***ON7RN**	**A**	**1,309,902**	**1369**	**106**	**340**
*ON4AUP	"	56,400	246	39	111
*ON5II	"	51,168	212	51	105
*ON5PJ	"	26,950	149	30	80
*ON5CZ	"	9,291	81	25	32
*ON4LCX	"	5,508	60	15	19
*ON4LDK	"	5,161	40	15	29
*ON4KMB	"	2,001	30	10	19

BOSNIA-HERZEGOVINA

T94DO	28	20,485	116	23	62
T97M	**14**	**495,818**	**1674**	**36**	**137**
***T99W**	**A**	**1,653,300**	**2212**	**115**	**380**
*T94LW	"	244,998	688	51	183
***T99T**	**28**	**72,924**	**275**	**23**	**95**
***T91ENS**	**21**	**167,382**	**559**	**34**	**119**
				(Opr. T93Y)	
*T92M	"	28,080	146	22	56
***T95A**	**7**	**101,505**	**704**	**20**	**81**
***T91EXA**	**3.7**	**30,485**	**446**	**11**	**56**
				(Opr. T94IW)	

BULGARIA

LZ5QZ	**A**	**589,680**	**1237**	**81**	**270**
LZ6A	"	573,699	978	95	262
LZ1BJ	"	170,872	464	61	187
LZ1BG	"	11,484	61	33	54
LZ3ZZ	**7**	**459,511**	**1979**	**37**	**132**
LZ1RN	"	25,056	272	13	59
LZ2FQ	"	4,346	90	8	33
LZ3AB	"	525	17	8	13
***LZ2NB**	**A**	**259,440**	**504**	**75**	**201**
***LZ2JA**	**21**	**121,800**	**398**	**31**	**109**
*LZ1CW	"	99,015	428	29	86
*LZ1HB	"	48,450	266	29	66
*LZ1ZC	14	20,276	213	17	57
*LZ2MP	3.7	9,130	160	7	48

CRETE

***SVØLK**	**A**	**164,565**	**597**	**51**	**156**

CROATIA

9A2YC	**A**	**415,338**	**644**	**94**	**247**
9A4X	**28**	**382,356**	**1187**	**35**	**136**
9A7R	**"**	**290,700**	**984**	**34**	**146**
9A4D	"	182,698	505	31	136
				(Opr. 9A2D)	
9A2AJ	"	150,891	510	33	126
9A9A	**21**	**1,517,020**	**3139**	**40**	**162**
9A3MR	**14**	**131,709**	**675**	**30**	**99**
9A5Y	**7**	**513,342**	**2063**	**36**	**135**
				(Opr. 9A7W)	
9A4KA	"	1,519	31	9	22
9A4KH	"	1,312	41	6	20
9A6A	**3.7**	**235,807**	**1620**	**28**	**115**
***9A2EU**	**A**	**1,457,708**	**1498**	**123**	**430**
*9A5J	"	235,800	627	55	207
*9A6ACY	"	133,759	515	37	144
*9A4VV	"	117,609	439	51	148
*9A2KO	"	70,518	308	41	120
*9A3CY	"	19,968	139	26	78
*9A3SM	"	14,847	117	23	78
***9A5Y**	**28**	**135,470**	**874**	**31**	**124**
				(Opr. 9A6KTS)	
*9A5MT	"	5,952	54	15	33
***9A2RD**	**21**	**229,067**	**614**	**37**	**114**
***9A /WA4IMC**	**14**	**438,501**	**1705**	**36**	**121**
*9A4RV	"	43,516	314	21	71

CZECH REPUBLIC

OK1RI	**A**	**4,838,015**	**3733**	**145**	**492**
OK1EP	"	896,831	1207	97	366
OK1FRO	"	75,888	332	44	142
OK1AVY	"	3,120	57	19	29
OK2BDI	"	1,488	23	14	17
OK1AXB	**28**	**34,430**	**142**	**28**	**82**
OK2SAT	**21**	**172,572**	**530**	**31**	**115**
OK1ARI	"	104,895	322	29	106
OK1IE	**7**	**34,435**	**206**	**21**	**76**
OK2RZ	**3.7**	**220,032**	**1561**	**27**	**101**
OK1FC	"	62,094	696	14	65
OK1FPS	"	51,908	605	12	64
OK2ZC	**1.8**	**16,626**	**398**	**6**	**45**
OK1TP	"	15,704	280	8	44
***OK1SI**	**A**	**188,738**	**456**	**63**	**190**
***OK1KZ**	**"**	**143,980**	**448**	**50**	**180**
*OK1MKI	"	117,968	402	44	158
*OK1DOL	"	103,124	318	45	158
*OK1DSZ	"	96,965	319	54	161
*OK2TBC	"	90,636	282	47	119
*OL7C	"	86,765	352	38	147
			(Opr. OK1FKV)		
*OK2PMS	"	60,261	343	39	120
*OK2BUG	"	47,748	223	40	133
*OK1FRT	"	39,235	219	31	102
*OK2SWD	"	36,375	160	25	100
*OK2PBG	"	34,060	177	30	100
*OK2DU	"	31,330	213	32	98
*OK2BPK	"	7,986	43	28	38
***OK2ZI**	**28**	**86,912**	**345**	**28**	**100**
*OK2PMM	"	20,448	101	23	49
*OK1CZ	"	4,056	45	15	24
***OK1FKM**	**21**	**151,034**	**464**	**32**	**125**
*OK2TH	"	18,750	100	25	50
*OK1ILM/P	"	11,368	102	17	39
*OK1MMN	"	100	45	16	25
*OK1DVK	14	1,443	30	7	30
***OK1HRR**	**3.7**	**17,741**	**300**	**7**	**53**
*OK1HXH	"	3,040	90	6	34

DENMARK

OZ9Y	**A**	**1,487,589**	**2117**	**77**	**270**
OZ1HXQ	"	1,088,530	1513	93	305
OZ5EV	"	336,114	432	94	332
OZ3SK	**1.8**	**46,368**	**671**	**11**	**61**
***OZ1ACB**	**A**	**198,492**	**520**	**68**	**170**
*OZ7AEI	"	58,090	297	33	124
*OZ4NA	"	55,714	217	42	136
*OZ5ABD	"	49,296	236	34	122
*OZ1JVX	"	42,912	230	31	118
*OZ7AX	"	38,628	157	34	140
*OZ6OQ	"	36,998	145	24	68
*OZ1IVA	"	9,156	105	22	62
*OZ9HN	21	7,254	48	31	78
*OZ3ZK	7	5,808	110	6	38

DODECANESE

SV5AZP	**21**	**202,264**	**1183**	**30**	**101**

ENGLAND

GØIVZ	**A**	**1,717,760**	**1987**	**103**	**337**
			(Opr. 8P6CV)		
M8X	**"**	**966,672**	**1258**	**99**	**312**
GØVSN	"	778,898	998	81	301
G3UFY	"	472,668	666	81	276
G3VAO	"	205,065	417	64	181
G3SEM	**28**	**55,521**	**342**	**22**	**71**
G3TBK	**21**	**305,696**	**891**	**36**	**128**
G4WTD	"	294,275	810	30	119
G4WSE	"	215,118	891	33	78
G4WPD	**1.8**	**9,774**	**202**	**7**	**47**
***G6QQ**	**A**	**158,922**	**427**	**57**	**186**
*GØMTN	"	76,350	228	46	104
*GØVQR	"	50,028	211	38	94
*G3RSD	"	43,240	199	29	86
*G3JKY	"	33,810	220	28	70
*G4NXG/M	"	20,698	101	34	45
***G4PCI**	**28**	**34,788**	**199**	**18**	**60**
***G4AXX**	**14**	**119,427**	**558**	**27**	**94**
*GØMRH	"	14,893	202	11	42
*G3XWZ	7	6,028	68	8	34

ESTONIA

ES1RA	A	60,786	175	59	139
ES1OX	"	37,268	118	54	100
ES1LBR	28	3,942	132	13	41
ES5TV	**14**	**411,879**	**1547**	**37**	**140**
***ES4NG**	**A**	**287,124**	**736**	**59**	**225**
*ES5RIM	"	22,950	174	27	75
*ES1QD	"	10,925	68	32	63
***ES2NA**	**28**	**20,066**	**177**	**18**	**61**
*ES7LGM	"	10,887	123	14	43
*ES6RHB	21	11,484	73	26	40
*ES5AAV/6	"	7,854	125	11	31
*ES1RG	"	5,544	80	10	34
***ES2RJ**	**14**	**339,328**	**1251**	**39**	**137**
*ES4LBO	7	1,716	44	7	26

EUROPEAN RUSSIA

RW4AA	**A**	**2,778,560**	**2606**	**137**	**471**
UA4HTT	**A**	**1,560,736**	**1719**	**125**	**419**
RK4WWA	**"**	**1,397,447**	**1844**	**116**	**405**
UA1OMS	"	813,024	1099	104	328
UA6JY	"	238,928	472	78	196
UA1AJW	"	225,138	418	77	237
RZ3AV	"	154,722	472	50	191
RW4WE	"	114,918	358	53	126
RZ6FZ	"	104,901	312	60	159
RV1CC	"	85,306	293	50	143
RA6LJ	"	82,386	250	55	144
RZ1AJ	"	72,468	297	38	145
RX3AW	"	41,615	150	39	106
RN3FA	"	37,808	131	44	92
RV6LOB	"	5,220	46	18	42
RV3YR	"	1,353	25	14	19
RA4CC	**28**	**116,880**	**411**	**28**	**92**
RV3LO	"	10,455	111	14	37
UA3XBB	"	4,042	62	13	30
UE6MAA	**21**	**306,045**	**1124**	**38**	**120**
RA1ACJ	"	4,074	38	16	26
UA3ABJ	**14**	**149,240**	**747**	**30**	**100**
RK4FD	**7**	**89,298**	**547**	**25**	**96**
UA1OZ	**3.7**	**17,840**	**315**	**19**	**61**
RA3VV	"	8,601	185	6	41
UA4CJJ	1.8	4,484	113	6	32
***RX3RC**	**A**	**856,508**	**1079**	**114**	**352**
***UA3BL**	**"**	**671,150**	**1112**	**103**	**330**
***RK3BY**	**"**	**428,970**	**683**	**95**	**300**
*RV6LFE	"	346,652	682	78	238
*UA4ASE	"	275,931	615	60	219
*RW4PK	"	230,174	425	78	209
*RU3FF	"	198,450	455	65	180
*UA6LHM	"	161,660	349	67	169
*UA3LHL	"	130,104	423	52	182
*RA1OJ	"	110,565	299	55	140
*RU4WE	"	84,150	334	47	140
*RA3UAG	"	72,468	267	50	148
*UA4FER	"	66,612	254	43	113
*UA4LBK	"	61,758	276	33	113
*U1BA	"	50,862	240	38	109
*RW1QM/1	"	44,545	228	37	114
*RX3AEX	"	41,748	191	45	102
*UA1AFZ	"	38,416	274	19	93
*UAØZDA/6	"	37,875	190	27	74
*UA1AKE	"	28,428	117	42	96
*UA4HAK	"	16,920	111	36	54
*UA4QK	"	12,212	89	22	50
*UA3DJY	"	1,440	25	14	16
***RK3XWD**	**28**	**37,916**	**217**	**21**	**65**
				(Opr. R3X-548)	
*UA1OMZ	"	3,367	46	14	23
***UA4LCQ**	**21**	**459,062**	**1447**	**36**	**142**
***RU4PL**	**"**	**387,855**	**1317**	**36**	**133**
*RA3DNC	"	92,837	409	27	100
*UA1ACC	"	50,648	273	25	79
*UA4ACP	"	15,774	132	18	48
***UA1ANA**	**14**	**47,200**	**314**	**23**	**77**
*RA1AW	"	46,002	285	26	76
*RX1AL	"	37,716	323	18	66
*RA3LJ	"	5,964	153	8	34
*RX3DNK	"	437	15	7	12
*RK1OWZ	7	4,620	79	9	33
***RU3DX**	**3.7**	**31,248**	**334**	**14**	**58**

EUROPEAN TURKEY

***TA1BM**	**A**	**41,501**	**617**	**29**	**99**

FINLAND

OH6RE	**A**	**462,565**	**867**	**75**	**280**
OH2VZ	"	133,536	360	51	163
OH2LYP	"	110,561	348	54	155
OH1BOI	"	43,516	179	37	135
OH1BV	"	39,884	145	42	76
OH5NBJ	"	30,096	121	43	71
OH3MMH	**28**	**56,763**	**327**	**26**	**93**
OH2KQ	"	3,081	27	14	25
OH3WW	**21**	**207,080**	**748**	**32**	**123**
OH2LZC	"	79,674	296	32	115
OH3JR	7	24,210	197	21	69
OH5VT	**1.8**	**32,640**	**482**	**8**	**56**
OH4MFA	"	5,040	114	6	34
***OH1LEG**	**A**	**204,828**	**351**	**75**	**228**
*OH2LNH	"	12,194	101	26	65
*OH6RC	"	10,296	68	27	61
*OH4YT	"	9,454	84	17	41
*OH1UP	"	2,867	44	14	33
*OH1WR	"	210	10	5	10
***OH1KF**	**28**	**49,320**	**217**	**27**	**93**
*OH5PA	"	6,426	50	16	38
***OH6MPJ**	**14**	**56,964**	**384**	**23**	**78**
*OH2UBF	"	37,056	262	23	73
			(Opr. OH2LP)		
*OH2BPA	"	27,968	204	21	71
*OH2BNX	7	2,340	58	7	29

FRANCE

F5NBX	**A**	**2,965,933**	**2569**	**120**	**403**
TM5L	**"**	**1,213,485**	**1415**	**104**	**351**
				(Opr. F5LBL)	
F5AMH	"	1,098,864	1216	104	364
F5BBD	"	747,093	1010	93	300
F2NH	"	357,798	483	74	220
F2AR	"	353,918	782	66	245
F5NBK	"	20,492	103	34	60
TM6P	**28**	**584,355**	**1537**	**31**	**132**
				(Opr. F6HPP)	
F6EMA	"	293,760	841	29	124
TM1W	"	257,382	704	30	128
F6HLC	**21**	**560,878**	**1395**	**36**	**142**
F6CQU	**14**	**433,911**	**1486**	**37**	**122**
F5OIH	3.7	16,644	228	8	49
F5RAB	1.8	5,687	112	6	41
***F5NZO**	**A**	**734,020**	**939**	**99**	**329**
***F6FTB**	**"**	**332,450**	**629**	**73**	**232**
***F5POJ**	**"**	**302,016**	**552**	**67**	**197**
*F5JBF	"	135,946	368	46	156
*F5TNI	"	133,196	288	85	199
*F6JHL	"	80,320	344	40	120
*F5NYK	"	30,365	161	32	73
*F5DXN	"	22,880	150	28	76
*F5HWB	"	8,000	40	40	40
*F5NJG	"	676	14	12	14
***F5BZB**	**28**	**159,408**	**468**	**28**	**116**
*F5PSA	"	86,400	298	24	84
*F5JIW	"	8,150	66	15	50
*FB1OMN	"	464	11	8	8
***F5BMK**	**21**	**256,452**	**910**	**33**	**109**
*F6FNA	"	58,344	272	24	80
*F8BDQ	14	9,118	152	8	39
***F2EE**	**3.7**	**49,938**	**512**	**15**	**67**

GERMANY

DL4NAC	**A**	**4,395,584**	**2918**	**142**	**550**
DJ4PT	**"**	**3,452,766**	**2506**	**141**	**477**
DJ6QT	**"**	**1,633,980**	**1487**	**126**	**439**
DL8PC	**"**	**1,574,056**	**1472**	**129**	**448**
DL2DX	"	1,237,470	1128	120	381
DJ3HJ	"	843,625	1019	96	329
DL8UCC	"	708,186	706	102	291
DJ5BV	"	686,670	795	106	364
DL6MHW	"	427,028	718	94	310
DAØGF	"	413,100	951	68	232
			(Opr. DL2JRM)		
DK2OQ/P	"	394,552	585	85	246
DJ8UV/P	"	363,341	865	78	241
DL1IAO	"	333,336	713	60	168
DF9RD	"	297,483	530	78	245
DL9NCR	"	292,545	467	81	216
DL8NFU	"	285,344	531	68	228
DM3HZN	"	226,672	437	69	179
DK4IO	"	206,371	417	67	190
DJØMW	"	175,426	377	61	178
DL8YR	"	122,324	286	54	158
DL6UNF	"	121,888	303	58	150
DJ4QO	"	108,297	294	49	140
DL3SR	"	100,648	279	51	133
DJ1YH	"	91,043	223	53	128
DH2PL	"	83,226	300	43	151
DL4DCC	"	77,814	311	45	153
DL5RBR	"	77,751	255	48	115
DL6MDT	"	77,280	242	51	109
DL6DH	"	47,278	194	40	114
DL5ZB	"	47,261	134	63	104
DL6AX	"	45,934	190	33	86
DL3DBY	"	39,468	200	34	122
DH4JQ	"	38,874	173	33	81
DL3DCY	"	25,420	141	33	91
DJ7IK	"	23,001	109	37	86
DL9XW	"	13,818	120	19	79
DJ5JH	**28**	**121,930**	**370**	**29**	**108**
DJ1ZU	"	84,401	351	22	93
DLØSG	"	57,334	292	22	87
			(Opr. DL4RCE)		
DFØTEN	"	42,336	194	25	83
DK1II	"	38,948	173	22	85
DJ6GK	"	15,540	93	24	60
DL6AKK	"	2,112	30	10	14
DF9ZP	**21**	**705,384**	**1672**	**38**	**156**
DL1AZZ	"	210,693	612	33	139
DJ9ZB	"	167,544	423	33	123
DL3KZA	"	154,869	503	30	113
DLØSA	"	130,176	456	32	112
DL9NDV	"	100,264	283	35	116
DFØBA	"	95,734	634	35	116
			(Opr. DJ9BK)		
DL4YAO	"	46,144	216	23	80
DJ7AA	**14**	**1,074,159**	**2558**	**39**	**174**
DK3GG	7	45,245	331	22	69
DL9NEI	"	4,982	85	12	35
DL7ALM	**3.7**	**45,765**	**508**	**13**	**68**
DK2JX	1.8	3,528	40	13	36
***DL2NBU**	**A**	**2,049,057**	**1710**	**128**	**489**
***DF7RX**	**"**	**1,319,744**	**1308**	**114**	**430**
***DL1MGB**	**"**	**1,096,959**	**1178**	**99**	**372**
*DF3QG	"	501,025	591	103	306
*DK7ZH	"	418,560	679	73	254
*DL1MAJ	"	398,732	523	81	251
*DF1ZN	"	395,975	553	79	258
*DF2FM	"	319,284	594	75	219
*DL3ZAI	"	314,004	568	59	215
*DJ3OE	"	269,748	549	62	192
*DL8SDC	"	261,396	501	67	207
*DL8NBJ	"	199,652	499	73	211
*DH2MA	"	175,951	600	62	189
*DL1ECG	"	174,876	432	60	176
*DL3BRA	"	148,285	370	61	174
*DL2VB	"	146,880	400	48	156
*DF1LON	"	122,718	362	52	174
*DH1PAL	"	121,766	450	40	174
*DL6UYA	"	119,416	365	54	130
*DF5ZV	"	115,920	329	48	136
*DJ3GE	"	114,624	344	47	152
*DL7UXG	"	110,696	407	40	162
*DL2AL	"	108,720	340	43	137
*DJ2OR	"	101,541	269	49	132
*DL1YTM	"	91,690	336	39	134
*DL2TG	"	84,000	225	56	94
*DL1FZZ	"	79,376	308	39	125
*DJ4DY	"	73,698	213	46	96
*DJ1OJ	"	67,596	221	51	121
*DJ8EW	"	66,880	216	51	125
*DJ5MN	"	61,614	166	49	140
*DL2GBB	"	58,608	240	40	108
*DL3YEI	"	54,060	232	39	120
*DJ2UB	"	48,248	208	38	110
*DK7FP	"	47,464	207	33	103
*DK8NX	"	39,900	105	57	93
*DL6PK	"	28,750	100	45	70
*DK6CQ	"	27,948	98	39	63
*DL1DCJ	"	22,523	149	24	77
*DL6ZNG	"	21,160	60	45	70
*DH2PG	"	17,955	112	27	78
*DL2MIH	"	14,996	65	38	54
*DL3HWW	"	14,065	92	37	60
*DL2ZAV	"	14,014	123	19	79
*DL3KDC	"	12,040	140	20	66
*DL9JW	"	11,730	140	14	71
*DL3DRN	"	9,963	81	22	59
*DL1AQY	"	8,631	95	23	40
*DL4OCM	"	8,288	63	25	49
*DL5ANS	"	7,808	65	21	40
*DLØBLA	"	7,062	72	18	48
				(Opr. DL2RSS)	
*DL5AUJ	"	40	6	4	6
***DJ2QV**	**28**	**43,334**	**212**	**21**	**73**
*DJØBX	"	15,120	95	20	43
*DL5PW	"	8,694	81	14	28
*DLØEUF	"	6,627	51	18	29
*DJ8OT	"	3,256	50	26	88
*DL3SCN	"	432	18	7	9
*DL7MAT	"	45	3	2	3
*DL6DCX	21	45,000	245	20	80
*DL9CC	"	21,320	105	22	30
*DL1SAN	"	12,060	105	16	44
*DF6LQ	"	1,104	24	8	15
***DK3DM**	**14**	**128,792**	**496**	**30**	**106**
*DL4VBS	3.7	21,750	215	9	49
*DL1KZA	1.8	4,943	135	6	35

GREECE

SV3AQR	14	11,340	62	21	62
SV7 /UYØMF	7	31,450	219	18	56
SV8CS	**1.8**	**39,284**	**747**	**15**	**77**
***SV1DZB**	**A**	**329,886**	**844**	**81**	**217**
*SV1DNW	"	136,955	389	66	179
***SV2AEL**	**28**	**268,940**	**856**	**34**	**136**
*SV1CIB	"	67,626	280	26	76
*SV1DKL	"	23,040	146	23	49
***SV2BFN**	**21**	**79,862**	**518**	**19**	**54**
***SV2CWY**	**3.7**	**84,630**	**866**	**20**	**85**
*SV1DET	1.8	4,264	94	5	36

HUNGARY

HAØIT	**A**	**1,225,500**	**1375**	**112**	**404**
HA2SX	**"**	**1,081,096**	**1575**	**98**	**303**
HA3FT	**28**	**64,792**	**275**	**23**	**81**
HG5J	**14**	**654,715**	**1983**	**38**	**147**
				(Opr. HA5JI)	
HG9X	**7**	**328,482**	**1620**	**32**	**126**
				(Opr. HA9PP)	
HA9MDN	"	35,266	400	13	64
HG5A	**3.7**	**57,222**	**927**	**19**	**83**
				(Opr. HA5IW)	
HA3NU	1.8	7,497	138	7	42
***HA8XX**	**A**	**334,508**	**681**	**79**	**268**
*HA5COK	"	75,208	185	51	107
*HA8IC	"	5,328	56	17	20
***HG9VHF**	**28**	**160,500**	**501**	**31**	**119**
				(Opr. HG9MET)	
*HA8YU	21	38,016	159	27	72
***HA3LN**	**3.7**	**38,152**	**633**	**10**	**55**
***HA8BE**	**1.8**	**36,894**	**561**	**9**	**57**

ICELAND

***TF8GX**	**A**	**254,775**	**549**	**59**	**178**

IRELAND

EI8GS	**A**	**742,592**	**1236**	**63**	**220**
***EI4DW**	**A**	**286,224**	**614**	**66**	**202**
*EI4BZ	"	250,832	527	56	188
*EI7IU	1.8	5,989	147	6	35

ISLE OF MAN

GD4GWQ	A	36,624	259	25	87

ITALY

IK4ADE	**A**	**1,705,088**	**1939**	**102**	**346**
IZ8Z	**"**	**1,695,172**	**1854**	**110**	**404**
II6T	**"**	**1,173,600**	**1549**	**118**	**371**
				(Opr. I6AIP)	
IK8NWK	"	1,161,904	1961	105	299
IK4WMB	"	609,868	949	80	242
IK1RLI	"	573,426	896	87	282
IK3UMT	"	462,774	504	108	334
IK6JNH	"	455,700	691	89	283
IK6GPZ	"	348,964	562	83	225
IZ8CGS	"	302,840	704	65	161
IK4XQH	"	293,607	923	37	116
IK4SDY	"	262,032	374	89	229
II6M	"	227,205	452	68	187
				(Opr. IK6WQU)	
IK3OII	"	175,380	401	64	173
IV3RLB	"	130,417	305	66	151
IZ2BKA	"	64,090	214	45	100
I4CSP	"	55,152	240	41	103
IK1ZOH	"	51,207	173	53	116
IK5YJK	"	25,248	123	30	66
IK7QHS	"	18,109	70	38	53
IK2WYI	"	13,410	116	18	27
IR5T	**28**	**187,616**	**606**	**31**	**133**
				(Opr. IK5ORP)	
IR4B	"	177,060	478	32	124
IK2YSA	"	97,988	360	27	104
IY4W	**21**	**1,005,714**	**2436**	**36**	**141**
				(Opr. I4LEC)	
I04L	**"**	**795,684**	**1846**	**37**	**146**
				(Opr. I4LCK)	
IR3R	"	492,125	1342	37	118
				(Opr. IK3STG)	

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IU4U	*	151,436	606	33	98
IK5ZTW	*	2,550	32	13	17
II3T	**14**	**665,145**	**1862**	**40**	**155**
			(Opr. IV3YYK)		
IK2SAU	*	295,350	941	37	142
IK2NCJ/4	**7**	**378,378**	**1296**	**30**	**117**
IQ5B	**1.8**	**28,566**	**525**	**9**	**60**
			(Opr. I5VXQ)		
***IV3UHL**	**A**	**951,684**	**1302**	**100**	**326**
***IV3ARJ**	**"**	**762,174**	**872**	**122**	**404**
***IO4I**	**"**	**366,792**	**532**	**94**	**254**
*I/FM5GU	*	288,708	703	66	228
*IQØA	*	247,908	455	75	217
			(Opr. IKØXBX)		
*IV3RJT	*	198,918	414	67	190
*IK3PQG	*	193,746	510	72	222
*IK1YLL	*	171,738	359	70	191
*IZ4BOY	*	171,477	425	69	192
*IK2RPE	*	134,915	345	61	162
*IK1YEE	*	115,400	314	54	146
*IK7RVY	*	85,120	268	51	109
*IZ1AWD	*	79,450	237	52	123
*IK8IFW	*	75,848	260	45	107
*IZ2ABN	*	64,428	165	53	103
*IK2REA	*	58,580	260	45	100
*IK1DFH	*	55,110	186	50	115
*IZØBXZ	*	52,452	211	37	104
*IK2RPK	*	49,686	180	47	100
*IK4WLP	*	47,334	178	48	113
*IK5NTF	*	47,304	187	37	109
*IK2OLJ	*	45,920	200	41	99
*I2WIJ	*	42,291	193	32	79
*IK2UVR	*	42,183	194	36	93
*IZ2BHQ	*	35,268	157	37	85
*IKØSTM	*	32,562	128	46	88
*IK7WPD	*	22,852	114	34	82
*IK2PTL	*	22,440	175	35	75
*IK2FXA	*	18,483	75	37	64
*IK2DUV	*	18,000	112	23	57
*IK4CBM	*	17,182	140	23	48
*IK3SCB	*	17,082	82	33	45
*IZ6CLN	*	15,857	114	30	71
*IK8YFU	*	13,440	99	26	54
*I2GHK	*	12,903	97	22	47
*IZ7BJT	*	12,240	99	24	61
*IK4YNR	*	10,872	62	31	41
*IKØJMS	*	10,498	95	21	37
*IK7WUE	*	9,300	96	24	38
*IV3KSE	*	8,840	75	25	43
*IK2VUC	*	5,661	64	13	24
*IK2IKW	*	5,310	41	25	34
*IZ3ALU	*	5,100	46	22	38
*IK2AIT	*	4,356	39	20	24
*IZØBXT	*	3,192	42	19	37
***IO8A**	**28**	**57,696**	**241**	**27**	**69**
			(Opr. IZ8BGY)		
*IV3BMV	*	20,254	102	25	57
*IZ7CDB	*	17,228	82	22	51
***IQ7A**	**14**	**335,916**	**1266**	**38**	**134**
			(Opr. IK7XIV)		
*I3MLU	*	137,193	590	31	108
*II8C	*	137,085	915	29	82
			(Opr. IK8AFN)		
*I4PZP	*	59,780	280	29	93
***IR7S**	**7**	**54,900**	**486**	**18**	**82**
			(Opr. IK7YUA)		
*IK7YTT	*	50,285	325	21	92
***IK3SSJ**	**3.7**	**47,888**	**667**	**13**	**60**

KALININGRAD

***UA2FP**	**A**	**180,342**	**583**	**51**	**207**
*UA2CZ	*	44,950	258	34	121

LATVIA

YL2KO	**A**	**923,704**	**1460**	**88**	**338**
YL8OMR	*	157,710	582	53	157
			(Opr. YL2MR)		
YL2IP	*	84,870	275	47	160
YL2GN	**14**	**180,600**	**909**	**31**	**109**
YL3IZ	**3.7**	**39,065**	**512**	**12**	**53**
***YL3FW**	**14**	**46,740**	**369**	**21**	**74**
*YL8ØUZ	1.8	3,531	105	5	28

LITHUANIA

LY5W	**A**	**1,905,260**	**2013**	**136**	**484**
LY2BM	**"**	**1,374,648**	**2014**	**107**	**385**
LY2BR	*	810,900	1322	92	333
LY63BH	*	447,598	863	86	240
LY2HN	*	72,568	239	46	147
LY2DX	*	60,702	321	29	122
LY2GF	**28**	**124,841**	**660**	**28**	**99**
LY2OX	**21**	**208,593**	**869**	**33**	**114**
LY2CU	14	2,765	72	9	26
LY3BX	**7**	**112,644**	**985**	**25**	**83**
LY61FW	**3.7**	**90,436**	**998**	**14**	**78**
LY3BS	**1.8**	**93,610**	**1222**	**13**	**61**
LY2HM	*	25,620	465	9	51
***LY63BA**	**A**	**1,707,480**	**2230**	**111**	**416**
***LY2BTA**	**"**	**1,150,515**	**1727**	**115**	**440**
*LY2FN	*	319,708	731	69	242
*LY2AE	*	145,418	400	52	169
*LY2PBM	"	78,218	406	33	118
*LY3BCY	"	15,194	147	17	54
*LY2HK	*	9,100	151	14	51
*LY62TZ	*	4,422	73	17	49
*LY3NQN	28	576	31	6	18
*LY2OU	3.7	10,653	179	6	47

LUXEMBOURG

LX1SP	**A**	**704,242**	**956**	**97**	**328**
LX2SM	**21**	**155,840**	**457**	**34**	**126**
LX1RQ	**14**	**131,138**	**571**	**29**	**90**
***LX1JH**	**A**	**116,298**	**356**	**53**	**160**

MACEDONIA

Z37FCA	A	525	11	11	10
Z32KV	28	481	37	6	7
*Z31GB	28	27,232	162	25	67
***Z31GX**	**21**	**539,766**	**1786**	**35**	**122**
***Z39Z**	**14**	**414,711**	**1695**	**38**	**139**
			(Opr. Z32AM)		
***Z31JA**	**"**	**378,184**	**1597**	**39**	**125**
***Z31RU**	**3.7**	**32,528**	**535**	**14**	**62**

MALTA

9HØA	**28**	**892,515**	**2073**	**37**	**158**
***9H1DE**	**A**	**226,416**	**587**	**56**	**156**

MOLDOVA

ER7N	**28**	**99,201**	**451**	**29**	**100**
			(Opr. UT7ND)		
***ER5DX**	**A**	**118,932**	**376**	**59**	**145**
*ER1BF	*	44,400	278	33	115
***ER3DW**	**14**	**139,842**	**868**	**24**	**78**
*ER3HW	1.8	9	183	7	37

NETHERLANDS

PAØAGA	**A**	**554,803**	**1093**	**80**	**273**
PAØIJM	**"**	**404,773**	**1020**	**71**	**240**
PAØKHS	*	358,832	805	68	260
***PA3GCV**	**A**	**534,674**	**850**	**87**	**275**
***PA3ELD**	**"**	**288,000**	**607**	**63**	**193**
*PAØRBS	*	118,770	414	46	168
*PA3GKE	*	55,242	251	39	123
*PAØKDM	*	33,540	192	37	119
*PA3GZC	*	18,894	150	30	64
*PAØJNH	*	17,696	158	35	77
***PA3EMN**	**21**	**62,376**	**330**	**26**	**87**
*PAØMIR	*	31,620	165	20	65
***PA2SWL**	**3.7**	**24,676**	**368**	**8**	**54**

NORTHERN IRELAND

GIØKOW	**A**	**7,388,788**	**5268**	**143**	**539**
***GIØKVQ**	**A**	**340,624**	**757**	**55**	**189**
*GI4MWA	21	14,257	119	13	40
*GIØOUM	*	9,648	103	12	36

NORWAY

LA6TP	A	45,892	217	37	112
LA2MJA	28	14,484	110	15	53
LA9DFA	**14**	**115,231**	**639**	**26**	**102**
LA2IR	*	61,285	328	23	80
LA6WEA	**1.8**	**13,572**	**209**	**8**	**50**
***LA2HFA**	**A**	**91,238**	**372**	**41**	**158**
*LA2EIA	*	57,744	321	32	112
*LA7CL	*	51,348	237	35	97
*LA6ZFA	*	39,932	248	31	118
*LA1PHA	*	28,222	173	33	70
*LA9IHA	*	1,296	30	12	24
*LA3JT	21	8,670	90	13	38

POLAND

SP9QMP	**A**	**666,111**	**1182**	**83**	**270**
SP6AZT	**"**	**566,406**	**935**	**105**	**354**
SP3JHY	"	232,686	410	66	212
3ZØXR	*	85,050	243	54	135
SP2DKI	*	57,155	250	39	122
SP9HZW	*	47,880	144	44	89
SP4Z	*	45,904	135	62	90
SP6AOI/P	*	32,319	121	43	90
SP3HUU	*	31,605	95	49	80
SP9WUM	*	25,950	144	52	98
SP9LDI	*	6,815	183	6	23
SP7VC/7	**28**	**132,351**	**403**	**33**	**124**
SP5CPR	*	120,984	474	30	112
SP2QVI	*	99,150	424	31	119
SP8FHK	*	88,734	364	30	108
SP5DDJ	*	86,450	353	32	101
SP6GF	*	32,922	135	26	67
SP5GRM	**21**	**782,565**	**1843**	**38**	**165**
SP3SLA	*	330,564	959	32	124
SP5LKM	*	97,966	370	33	113
SP5BB	*	82,088	317	26	98
SP6FJ	*	11,700	65	25	50
SP9ZBC/P	*	7,067	98	15	22
			(Opr. SQ9DJD)		
SP3MEP	*	3,478	37	13	24
SN2B	**14**	**1,016,784**	**2693**	**40**	**167**
			(Opr. SP2FAX)		
SP2UUU	*	90	6	3	6
SP7GIQ	**3.7**	**147,599**	**1233**	**21**	**82**
SP4SAF	1.8	1,206	54	3	20
SP9VRY	*	918	33	6	21
***SP9XWD**	**A**	**388,935**	**724**	**75**	**260**
***SP7A**	**"**	**121,800**	**344**	**55**	**148**
			(Opr. SP7FQI)		
*SP5MXA	*	100,061	327	47	132
*SQ5AAS	*	86,515	307	38	105
*SP1DPA	*	77,644	196	57	131
*SQ1BVG	*	65,852	338	55	108
*SP6OJE	*	64,386	298	38	109
*SQ5EWG	*	62,100	262	46	134
*SP4MPA	*	51,516	284	34	128
*SP9XUE	*	42,117	197	34	105
*SP3NUN	*	41,448	199	43	144
*SQ9DXN	*	38,171	123	47	86
*SQ9BDV	*	17,160	115	33	71
*SP7EXJ	*	13,330	98	23	53
*SP6CXH	*	9,177	73	22	47
*SP9KJU	*	4,715	67	25	37
			(Opr. SP9MDY)		
*SP6BEN	*	3,780	36	19	23
*SP3EJL	*	3,534	48	20	37
*SP7LHX	*	2,288	24	9	19
*SP4CGJ	*	1,804	44	25	16
*SQ4CTM	*	1,034	29	20	27
***SP3LWP**	**28**	**37,300**	**776**	**25**	**75**
*SP9RVD	*	23,654	130	23	61
*SP5LCC	*	20,559	122	21	56
*SP9KGG	*	14,074	130	22	40
*SQ8GBN	*	13,530	115	15	51
*SP4NKJ	*	6,050	59	16	39
*SP1EOI	*	1,950	26	10	15
*SP6OJG	*	1,378	53	11	15
*SP9PTG	*	1,300	29	10	15
***SP9XCN**	**21**	**215,600**	**623**	**34**	**120**
*SP8NCJ	*	130,077	404	30	119
*SP6IXU	*	26,400	155	22	53
*SP9OYK	*	25,308	190	19	57
*SP2AHD	*	23,821	128	18	65
*SP9HQC	*	18,648	120	18	54
***SP3GTS**	**14**	**67,952**	**267**	**28**	**96**
*SP6PAX	*	28,224	111	8	28
*SP2GNB	*	5,529	80	10	44
*SQ2CFJ	*	3,420	81	7	29
***SP9NLK**	**7**	**36,354**	**360**	**17**	**66**
*SP9ABU	*	23,177	220	14	63
*SP6BBE	3.7	42	7	1	5
*SP9RPW	1.8	6,168	157	6	37

PORTUGAL

CT1FUE	A	72,846	302	33	81
CT1ERK	*	14,196	72	34	50
CT4NH	**28**	**874,665**	**2046**	**32**	**133**
CT1AHU	*	408,192	1279	28	100
CT2GQN	*	45,627	258	21	46
CT4HA	*	37,584	361	19	35
CT1CIR	*	6,923	57	10	28
CT8T	**21**	**583,142**	**1759**	**35**	**126**
CT1AOZ	**14**	**352,000**	**1209**	**35**	**141**
CT1BNW	*	101,178	400	30	96
CT1CLR	*	52,740	332	20	70
***CT7GTP**	**A**	**188,031**	**391**	**59**	**174**
*CT1EWA	*	77,131	296	33	104
*CT7GXJ	*	70,848	238	52	140
*CT1QF	*	31,218	152	27	59
*CT2FZZ	*	5,664	83	12	36
***CT1ELP**	**28**	**370,194**	**1100**	**28**	**114**
***CT1ESO**	**"**	**369,025**	**1029**	**32**	**125**
*CT1EAT	*	193,895	725	25	70
*CT1FLD	*	39,292	206	20	56
*CT1FNT	*	16,632	130	16	38
*CT2GFQ	*	9,435	71	16	35
*CT1AGS	21	17,420	106	19	46
*CT1ETX	14	27,824	196	15	59
*CT4NC	*	7,482	86	12	31
***CT1BWW**	**7**	**103,736**	**378**	**26**	**92**
*CT2GPQ	*	11,424	136	12	44

ROMANIA

YO5BRZ	**A**	**972,792**	**1231**	**115**	**357**
YO2LLG	*	288	9	7	9
YO4NF	**14**	**521,242**	**2371**	**39**	**119**
YO3KPA	**7**	**110,040**	**688**	**25**	**95**
			(Opr. YO3FWC)		
YO3GOD	*	43,680	445	18	73
***YO3APJ**	**A**	**936,960**	**1053**	**108**	**404**
***YO8FR**	**"**	**543,655**	**807**	**70**	**247**
*YO3FRI	*	535,388	811	93	298
*YO2DFA	*	328,762	852	71	251
*YO5CYG	*	299,282	633	70	232
*YO6BHN	*	279,277	496	78	239
*YO8RFS	*	178,296	457	39	145
*YO9JIM	*	72,988	262	36	106
*YO2LAU	*	66,198	289	49	128
*YO2CJX	*	43,432	329	19	103
*YO9GJY	*	30,030	282	40	70
*YO2QY	*	25,647	97	43	60
*YO3AIL	*	18,315	85	38	73
***YO3NL**	**28**	**52,338**	**176**	**29**	**93**
*YO4FRJ	*	37,534	157	29	69
***YR9P**	**21**	**290,832**	**851**	**36**	**130**
			(Opr. YO9HP)		
*YO4CIS	*	210,300	834	33	117
*YO9IF	*	19,652	134	18	37
***YO2LDE**	**14**	**36,059**	**306**	**22**	**85**
*YO4FRF	*	2,268	50	7	29
***YO2KAB**	**3.7**	**33,660**	**609**	**11**	**57**
			(Opr. YO2LIF)		
*YO9AHX	*	920	40	3	20

SARDINIA

ISØNHT	**28**	**229,494**	**681**	**32**	**106**
*ISØLLJ	A	29,016	128	37	67
*ISØLDT	*	15,470	98	28	63
***ISØGYW**	**28**	**310,990**	**897**	**28**	**109**

SCOTLAND

GM4AFF	**A**	**1,518,933**	**2025**	**106**	**387**
GM3BCL	*	600,497	901	65	216
GM3UTQ	*	314,130	602	62	221
GM4FDM	**21**	**907,144**	**2176**	**37**	**130**
GM4YXI	*	708,196	1787	38	150
GM8V	**14**	**1,031,400**	**2790**	**40**	**160**
			(Opr. GM3WOJ)		
GMØEGI	3.7	2,507	53	4	19
*GM4CUX	A	85,820	257	44	96

SICILY

IT9IQQ	**21**	**142,206**	**546**	**31**	**106**
IT9STX	**14**	**539,724**	**2008**	**37**	**127**
IT9THD	3.7	18,792	249	9	49
***IT9RDG**	**A**	**1,030,432**	**1432**	**101**	**315**
***IT9RYJ**	**21**	**216,840**	**828**	**32**	**107**
***IT9RZR**	**14**	**236,808**	**1086**	**37**	**119**
*IT9ICS	*	88,803	701	28	89
*IT9LTA	*	51,192	297	25	83

SLOVAK REPUBLIC

OM3IAG	**A**	**757,332**	**1310**	**94**	**292**
OM3EA	**28**	**83,570**	**258**	**30**	**107**
OM7M	**21**	**600,544**	**1471**	**40**	**156**
			(Opr. OM5RW)		
OM6NM	*	290,037	1008	34	107
OM3CW	*	179,894	607	31	112
OM5M	**7**	**270,340**	**1426**	**32**	**108**
***OM4DN**	**A**	**251,658**	**687**	**57**	**222**
*OM4KK	*	210,338	484	64	187
*OM3YK	*	160,035	465	48	179
*OM6TX	*	67,319	273	44	119
***OM5FA**	**28**	**157,200**	**617**	**31**	**119**
*OM7YC	21	5,170	50	17	30

SLOVENIA

S55A	**A**	**1,113,052**	**1312**	**107**	**356**
S54X	*	483,327	834	85	266
S53MA	*	396,571	703	75	238
S59L	*	55,950	224	48	102
S53R	**28**	**446,200**	**1162**	**35**	**149**
S5ØL	**"**	**398,398**	**1097**	**35**	**147**
			(Opr. S53EA)		
S51TA	*	220,056	744	31	142
S5ØC	**21**	**1,001,622**	**2225**	**39**	**155**
S5ØU	*	842,800	1942	39	161
S52EZ	*	590,011	1586	36	131
S55HH	*	131,634	445	34	108
S53M	**14**	**771,876**	**2071**	**39**	**150**
			(Opr. S51ZO)		
S5ØK	*	712,908	2035	39	150
S57MW	*	452,244	1554	38	131
S5ØA	**3.7**	**357,846**	**1689**	**29**	**117**
S51ØI	**"**	**107,613**	**996**	**20**	**79**
S57M	**1.8**	**50,040**	**675**	**10**	**62**
S5ØR	*	36,630	582	11	55
S54E	*	16,245	291	8	49
S52OP	*	12,201	270	6	43
***S59AA**	**A**	**1,276,560**	**1233**	**119**	**421**
***S59KW**	**"**	**697,718**	**1045**	**87**	**340**
*S57U	*	575,906	734	92	306
*S53BM	*	323,505	646	76	239
*S53X	*	293,112	600	71	205
*S53FO	"	292,906	568	67	207
*S57AL	"	121,191	252	59	144
*S55WW	"	121,095	356	49	146
*S57NPR	"	87,648	423	39	127
*S53DX	*	73,616	259	47	125
*S51MG	*	11,480	107	24	58
***S52OT**	**28**	**147,888**	**539**	**33**	**125**
*S51MA	*	132,600	393	29	121
*S57J	*	125,860	391	30	125
*S58D	*	102,258	335	31	107
***S5ØQ**	**21**	**213,408**	**702**	**36**	**116**
***S58WW**	**14**	**258,366**	**1006**	**34**	**115**
***S57DX**	**7**	**177,642**	**970**	**29**	**113**
***S54A**	**"**	**80,128**	**497**	**28**	**100**
***S57KAA**	**3.7**	**31,720**	**435**	**9**	**56**
*S57CQ	*	17,595	474	12	57
*S51NM	*	17,030	251	10	55
*S57MSU	*	10,476	179	9	45

SPAIN

EA1UX	**A**	**1,143,733**	**2141**	**72**	**205**
EA1BLX	**"**	**925,680**	**1554**	**66**	**219**
EA3GBU	**"**	**548,760**	**823**	**87**	**253**
EA3AQQ	*	275,840	548	81	239
EA1BLA	*	201,213	395	63	174
EA1FCR	*	143,073	415	47	142
EA1DFP	*	91,052	166	74	132
EA3GHQ	*	54,075	206	37	66
EA5GMA	*	36,720	151	46	98
EF5AMK	*	34,800	181	26	90
			(Opr. EC5AMK)		
EA1BXM	*	24,592	108	34	72
EA3TA	*	16,356	97	31	63
EA1FT	*	6,627	114	18	29
EA2AZ	*	5,612	81	32	60
EA5EI	*	3,916	31	16	28
EA7GB	*	2,680	30	15	25
EA3BCP	**21**	**455,895**	**1201**	**37**	**128**
EA4BT	*	262,160	767	34	111
EA1BCK	*	152,207	481	33	104
EA1JO	*	150,579	521	30	113
EA7AKB	*	26,720	184	20	60
EC1DHA	*	6,490	86	15	44
EC1DMQ	*	4,000	60	15	35
EC3DFE	*	1,785	27	14	21
EA3ATM	**14**	**755,188**	**2021**	**39**	**157**
EA3IN	*	195,552	651	35	133
EA2BNU	*	8,892	132	13	44
EA5AT	**1.8**	**19,668**	**292**	**10**	**56**
EA1FBU	*	2,550	64	5	25
***EA3BKI**	**A**	**1,086,788**	**1378**	**91**	**297**
***EA5ARC**	**"**	**1,012,680**	**1185**	**115**	**407**
***EA3GEG**	**"**	**779,471**	**1004**	**86**	**285**
*EA3GHZ	*	713,514	882	93	290
*EA7AKK	*	508,234	894	76	250
*EA5WX	*	438,861	718	61	180
*EA1EB	*	407,256	706	66	218
*EA3ELZ	*	405,792	648	72	216
*EA5EOR	*	403,224	693	72	245
*EA3DUW	*	325,810	904	72	238
*EA1AW	*	314,928	562	63	180
*EA1IF	*	301,710	810	60	207
*EA1AUT	*	294,320	634	61	222
*EA3ASX	*	279,675	415	79	196
*EA7AGW	*	267,020	433	88	250
*EA7IA	*	263,351	440	76	193
*EA4ECF	*	258,408	506	59	163
*EA3AM	*	257,226	450	73	185
*EA5ASF	*	253,176	446	73	201
*EA3ASS	*	219,972	435	70	206
*EA1BLI	*	217,980	533	68	184
*EA1AEG	*	210,672	458	53	175
*EA7HCU	*	161,528	391	62	182
*EA1AAW	*	152,064	372	60	138
*EA1CJ	*	149,310	359	60	177
*EA3OP	*	144,936	412	54	162
*EA7EWX	*	131,480	373	53	120
*EA1EVR	*	131,306	381	40	126
*EA1FBO	*	130,733	350	60	179
*EA1CP	*	128,438	350	41	108
*EA5AJX	*	119,784	295	48	120
*EA5AFH	*	118,428	233	69	215
*EA1ET	*	115,400	293	59	141
*EA1JW	*	113,126	279	69	178
*EA1BPO	*	94,478	324	53	141
*EA3FAJ	*	92,685	257	53	132
*EA7GXX	*	88,704	237	46	98
*EA4BSC	*	82,346	188	44	165
*EA5AEN	*	76,708	217	44	107
*EA7TG	*	76,633	160	66	131
*EA5BAO	*	71,820	278	46	144
*EA1GL	*	69,204	223	42	104
*EA2BEY	*	69,102	311	21	78
*EA3BCM	*	66,768	241	41	115
*EA1CJH	*	66,584	160	53	150
*EC1BXI	*	65,067	370	29	94
*EA5IL	*	60,454	143	52	115
*EA5UW	*	60,312	289	40	128
*EA4EMC	*	54,288	200	37	79
*EA3EVR	*	50,856	163	39	65
*EC5AEB	*	50,285	343	26	87
*EA5FME	*	50,184	231	42	122
*EA1DFZ	*	49,236	160	32	100
*EA3DVJ	*	48,233	185	40	99
*EA7CWV	*	44,460	135	43	87
*EA3DNC	*	43,290	165	33	84
*EA5FWW	*	41,097	113	50	83
*EA1BHR	*	39,435	202	48	117
*EA4DKS	*	36,356	198	34	88
*EA1BAW	"	36,179	152	35	86
*EA2CND	*	34,036	120	40	94
EA3AMV/5		33,532	163	28	73
*EA3NA	*	33,325	233	67	141
*EA1AUM	*	33,178	154	35	71
*EA5CGU	*	32,810	101	48	122
*EA5CZL	*	32,079	150	35	76
*EA7ATF	*	30,738	149	33	76
*EA4D8E	*	28,638	132	30	81
*EA1CQJ	*	23,868	152	23	45
*EA3GGW	*	23,862	114	30	67
*EA3GDX	*	18,224	114	20	48
*EA3ESZ	*	17,154	226	23	88
*EA4CIE	*	17,028	128	37	92
*EA4CU	*	14,880	115	17	43
*EA4AXZ	*	14,523	67	30	73
*EA5NU	*	13,200	73	28	38
*EA5CRU	*	13,140	87	24	49
*EA1EDF	*	11,644	99	23	39
*EC1ANZ	*	11,537	182	19	64
*EA7AFD	*	10,797	107	16	43
*EA1ASI	*	10,374	76	26	52
*EA1FY	*	10,032	54	28	38
*EA1HP	*	8,148	79	25	59
*EC7DYH	*	5,247	58	18	35
*EA3AAW	*	4,998	69	18	33
*EA5FRP	*	4,050	29	25	29
*EA3ACA	*	3,822	50	19	30
*EA4AHD	*	3,550	33	23	27
*EA4EJR	*	2,706	31	14	27
*EC2BAH	*	2,501	35	17	24
*EA3GIP	*	2,268	59	10	32
*EA3FFE	*	1,215	21	14	13
*EA5CXM	*	440	15	9	13
*EA4AZZ	*	147	10	5	10
***EA7GTF**	**28**	**400,652**	**1044**	**31**	**133**
***EA7FTR**	**"**	**391,820**	**1112**	**29**	**114**
***EA7HBP**	**"**	**364,287**	**1136**	**27**	**106**

*EA1FDI	*	310,596	964	29	103
*EA1CBX	*	161,980	726	20	71
*EA3FCQ	*	156,807	500	27	106
*EA7OO	*	100,852	448	25	51
*EA3TI	*	97,569	330	24	87
*EA7AKJ	*	53,064	241	22	66
*EA1CXH	*	33,810	191	20	50
*EA7ALO	*	22,500	111	19	56
*EA5DIT	*	19,437	80	25	68
*EA5AAJ	*	13,208	91	18	34
*EA5GMB	*	12,844	111	18	34
***EA7DBO**	**21**	**336,812**	**1172**	**35**	**126**
***EA3QP**	**"**	**219,304**	**701**	**32**	**126**
***EA1CVY**	**"**	**193,110**	**612**	**28**	**95**
*EA1FFH	*	117,468	570	24	93
*EA7ANM	*	105,910	715	21	64
*EA3NB	*	102,225	299	32	109
*EC3AJW	*	57,680	273	28	84
*EA3BIM	*	47,937	274	19	68
*EA1BAF	*	37,655	230	19	66
*EC3AJQ	*	29,800	127	24	76
*EA1HA	*	24,565	213	21	64
*EC4DJY	*	14,508	145	17	45
*EC3ALV	*	11,904	109	18	44
*EC4AGJ	*	8,700	79	10	50
*EC3CMT	*	7,564	87	16	45
*EC3AGM	*	7,038	75	15	36
*EC5AIL	*	6,160	64	12	43
*EA3KT	*	3,564	55	8	14
***EA4BL**	**14**	**147,668**	**657**	**31**	**103**
*EA3AJP	*	88,303	457	26	87
*EA4OI	*	65,653	326	28	85
*EA3FYP	*	46,752	270	22	74
*EA3CT	*	35,432	222	19	67
*EA5TN	*	4,464	70	12	36
***EC1CFD**	**3.7**	**41,676**	**408**	**13**	**56**
*EA3FF	*	17,270	182	11	52
*EA1DVY	1.8	7,332	115	6	41

SWEDEN

SM5CEU	**A**	**816,262**	**1209**	**116**	**374**
SM3BIZ	*	303,072	570	82	270
SM5CSS	*	191,187	407	70	221
SM3CVM	*	23,500	102	33	61
SM7DXQ	*	18,096	88	29	75
SK3JR	*	9,381	100	15	38
SMØKV	**21**	**132,242**	**442**	**32**	**115**
***SM3WMV**	**A**	**120,695**	**513**	**48**	**191**
***SMØBDS**	**"**	**120,496**	**347**	**50**	**167**
*SM7BJW	*	118,440	332	61	174
*SM2KAL	*	110,675	242	57	176
*SM3CBR	*	37,920	184	43	115
*SM4TIY	*	32,639	190	99	28
*SM5OK	*	14,415	108	26	67
*SMØFM	*	8,403	123	38	91
*SM4WGB	*	6,936	68	22	46
*SM4HEJ	28	3,116	38	10	28
*SMØDZH	*	720	20	6	12
*SK4UW	7	4,452	101	8	34
			(Opr. SM4JHK)		
*SM7HSP	*	360	12	10	12
*SM3ARR	*	18	3	3	3

SWITZERLAND

HB9AAA	**A**	**428,934**	**604**	**80**	**211**
HB9NN	14	22,890	183	18	52
***HB9ARF**	**A**	**174,080**	**409**	**64**	**192**

UKRAINE

UT7DX	**A**	**1,894,200**	**1949**	**134**	**440**
UT4UO	**A**	**1,370,216**	**1660**	**112**	**360**
UTØU	**"**	**1,223,638**	**1626**	**122**	**372**
UR7M	*	800,793	1258	96	307
UT3UZ	*	682,479	1198	107	364
UT2IW	*	662,000	911	91	309
UX1UA	*	654,232	1055	95	329
UU7J	*	411,900	878	64	236
UT6EE	*	131,433	422	43	150
UR5E	*	96,984	351	54	162
UT7MD	*	47,260	200	32	107
UT5UOC	*	45,346	125	54	104
UR4MRT	*	37,332	219	22	100
US1QA	*	23,940	84	38	76
UT5UGR	**28**	**162,674**	**786**	**33**	**130**
UT1IA	*	130,355	436	31	114
U5WF	*	107,304	357	33	103
UT8IM	**21**	**186,265**	**1045**	**32**	**105**
UR8LA	*	110,160	424	28	116
UT7LA	*	102,432	403	28	104
UTØH	*	43,164	248	23	76
			(Opr. UX2HX)		
U5IZ	**14**	**661,309**	**2002**	**39**	**153**
UR6MW	*	25,696	245	12	61
UY5ZZ	**7**	**119,460**	**796**	**29**	**103**
UXØHA	*	53,110	418	20	74
UX7MM	**3.7**	**48,048**	**546**	**14**	**70**
US2IZ	*	33,615	370	14	67
UT7QL	*	23,100	270	12	58
***US3IZ**	**A**	**208,048**	**517**	**68**	**205**
***UT5HA**	**"**	**204,807**	**455**	**65**	**228**
*US2WU	*	90,404	185	62	132
*UR5FCM	*	5,643	85	15	42
***UX8IX**	**28**	**91,930**	**478**	**30**	**108**
*U5WF	*	88,836	342	32	100
*UR5QBB	*	35,805	170	23	70
*UR4QSG	*	18,216	131	24	64
*US9QA	*	9,504	100	18	36
*UT5UGQ	*	36	3	1	3
***UT7QF**	**21**	**125,022**	**539**	**29**	**105**
*UT1HT	*	6,270	43	17	38
***UU7JX**	**14**	**200,825**	**769**	**38**	**107**
*UX3MO	*	67,045	388	27	88
*UR4EWT	*	49,106	363	22	64
			(Opr. UR6EX)		
*UT1WW	*	2,432	62	8	24
***UT1T**	**7**	**62,177**	**618**	**19**	**73**
			(Opr. UR7TZ)		
*US5ESP	*	3,397	47	9	34
***UX3M**	**3.7**	**34,200**	**366**	**13**	**62**
			(Opr. UR3MP)		
*US8IBS	*	2,627	37	9	28

WALES

GW4BLE	**A**	**4,520,836**	**3321**	**124**	**432**
GWØGEI	*	1,406,669	1804	99	352
GW4BVJ	*	226,969	452	66	197
GW8GT	**21**	**527,310**	**1637**	**33**	**122**
GW3JXN	**14**	**417,795**	**1546**	**37**	**124**

YUGOSLAVIA

4N9BW	**A**	**5,240,144**	**3722**	**159**	**608**
YT1AD	**"**	**3,023,440**	**2800**	**123**	**437**
			(Opr. YU1DX)		
YZ7AA	*	1,838,467	1953	121	426
YZ1ZI	*	3,500	82	11	37
406A	**28**	**450,248**	**1295**	**36**	**148**
			(Opr. YT6A)		
YU1RE	*	102,960	342	29	114
YU1KX	**21**	**623,149**	**1654**	**39**	**140**
YT1R	*	416,304	1208	38	130
YU7CF	*	132,000	575	31	94
4N1N	*	62,493	335	28	83
YU7KWX	*	49,664	379	21	43
4N7B	**14**	**945,507**	**2695**	**39**	**174**
YZ9A	*	715,716	2246	37	151
			(Opr. YU1AU)		
YU1JW	*	547,284	1998	37	140
YT1BB	**7**	**362,294**	**1732**	**34**	**124**
YU7ABN	3.7	8,056	165	8	45
YZ6A	**1.8**	**49,640**	**714**	**10**	**63**
			(Opr. Zeljo)		
406A	**"**	**43,524**	**632**	**9**	**69**
***YU7AL**	**A**	**1,275,000**	**1467**	**110**	**400**
*YU7AM	*	100,880	337	51	143
*YU7SF	*	93,600	300	44	136
*YU1BO	*	5,670	49	22	32
***4N7TW**	**28**	**77,440**	**260**	**27**	**101**
*YU7KM	*	32,852	153	24	62
***YU1CC**	**3.7**	**48,646**	**542**	**12**	**68**
*4N1A	*	42,028	479	13	66
***YU1RA**	**1.8**	**14,250**	**253**	**8**	**49**
*YU1AST	*	3,960	128	5	35

OCEANIA

AMERICAN SAMOA

AH8LG	A	109,480	242	63	107

AUSTRALIA

VK5GN	**A**	**2,282,132**	**2035**	**121**	**277**
VK2ARJ	*	830,826	1426	62	140
VK4XY	**28**	**206,980**	**943**	**28**	**51**
VK4CEJ	*	113,077	541	25	48
VK2APK	**21**	**169,312**	**636**	**28**	**76**
VK5OE	14	2,552	33	12	17
VK4EMM	**7**	**134,628**	**598**	**21**	**57**
***VK4EJ**	**A**	**544,974**	**1000**	**68**	**105**
*VK2BJ	*	71,724	157	63	109
*VK4NM	*	10,207	68	24	35
***VK4DZ**	**28**	**249,249**	**1106**	**24**	**53**
***VK3TZ**	**14**	**268,176**	**648**	**34**	**114**

BRUNEI

V8A	**A**	**7,973,850**	**5206**	**153**	**377**
			(Opr. JO1RUR)		

EAST MALAYSIA

9M6AAC	**A**	**8,710,746**	**5278**	**157**	**416**
			(Opr. KD6WW)		
9M8R	**21**	**1,944,800**	**3471**	**38**	**162**
			(Opr. W7EJ)		

HAWAII

NH7A	**A**	**4,393,940**	**4120**	**125**	**248**
KH6T	**28**	**789,096**	**2821**	**29**	**69**
KH6FKG	**7**	**233,370**	**912**	**28**	**62**
KH6CC	**1.8**	**3,839**	**117**	**5**	**6**
*KH6 /KØOST	28	3,185	38	13	22
***KH6GMP**	**21**	**295,563**	**1255**	**28**	**55**

INDONESIA

YB9BV	**A**	**260,091**	**482**	**76**	**171**
YCØLBK	**21**	**220,077**	**775**	**32**	**85**
YCØHXH	*	24,048	158	23	49
***YC8VIP**	**A**	**266,880**	**634**	**60**	**100**
***YB1KOR**	**"**	**252,994**	**520**	**79**	**159**
*YC8TXW	*	186,048	677	41	61
*YC8VAC	*	37,572	221	35	58
*YC8RBC	*	34,400	299	15	28
***YB2LAB**	**28**	**221,650**	**633**	**33**	**97**
***YB2ERL**	**21**	**108,194**	**418**	**27**	**67**
*YC6DEM	*	25,935	161	25	40
*YCØMZI	*	14,700	96	19	41
*YC3SZM	*	1,440	26	11	13
*YCØLOW	1.8	42	3	3	3

NEW CALEDONIA

FK8HC	**28**	**1,505,160**	**3555**	**36**	**112**
FK8GM	**21**	**1,249,119**	**3253**	**34**	**107**
***FK8VHN**	**A**	**1,320,560**	**1745**	**90**	**182**
***FK8FI**	**14**	**630,605**	**1599**	**35**	**110**

NEW ZEALAND

ZL1ANJ	**A**	**286,704**	**546**	**77**	**121**

NORTHERN MARIANAS

KHØI	**A**	**3,506,976**	**4210**	**113**	**239**
WHØV	**"**	**3,211,538**	**3396**	**117**	**224**
KHØCE	**21**	**450,791**	**1532**	**31**	**76**
NHØE	*	76,452	314	29	63

PAPUA-NEW GUINEA

***P29NB**	**A**	**710,208**	**995**	**90**	**184**

PHILIPPINES

***DU1ØØLER**	**A**	**230,947**	**530**	**51**	**106**
***DU1ØØFZB**	**28**	**56,908**	**507**	**18**	**23**
***DU3RCM**	**14**	**564,589**	**1420**	**36**	**115**

TONGA

*A35XU	A	128,037	317	61	86
			(Opr. PA3AXU)		

TUVALU

*T2DX	A	129,525	275	59	98
			(Opr. W4WET)		

SOUTH AMERICA

ANTARCTICA

EM1LV	**A**	**1,028,896**	**1281**	**100**	**216**
			(Opr. UR8LV)		

ARGENTINA

LU1HLH	**A**	**2,664,288**	**2648**	**107**	**289**
L77E	**"**	**2,299,608**	**2958**	**95**	**233**
			(Opr. LU4DXU)		
LW1DX	*	506,230	951	64	166
LU/OH1EB	*	684	22	9	10
LU6ETB	**28**	**2,368,128**	**4389**	**38**	**154**
L2F	**"**	**1,262,184**	**3340**	**30**	**124**
			(Opr. LU9FDG)		
LT3C	**"**	**1,196,968**	**3286**	**32**	**125**
			(Opr. LU3CT)		
LU2FA	"	1,158,879	3148	34	107
LU5MM	"	1,032,021	2926	31	106
LU5WW	"	676,570	1721	31	114
LV4V	"	672,465	2144	27	100
LW6EQG	"	455,112	1790	29	97
LT5V	"	410,640	1499	28	90
			(Opr. LU8VCC)		
LU1MA	*	241,627	1013	23	74
LW8EXF	*	122,998	529	24	65
LW1EA	*	100	29	11	19
LU9DX	*	100	77	19	30
LT1F	**21**	**1,105,767**	**3508**	**38**	**131**
			(Opr. LU1FKR)		
L5ØV	*	273,306	1013	28	73
LU5HM	**14**	**924,426**	**2284**	**37**	**122**
LQ4I	*	740,028	1652	39	127
			(Opr. LU4IC)		
LU3HY	*	721,656	1862	36	120
LU1DK	*	439,920	1315	32	88
LU7H	*	51,624	171	29	79
			(Opr. LU2HAO)		
LU3VAO	7	2,046	34	14	19
***LU5VV**	**A**	**1,618,176**	**1820**	**95**	**241**
***LU2UE**	**"**	**1,498,848**	**1848**	**95**	**217**
*LU1UM	*	1,347,800	1768	87	206
*LU9HO	*	1,262,093	1530	78	223
*LU7HN	*	1,157,760	1666	71	197
*LT5Y	*	725,040	1310	64	126
			(Opr. LU1YU)		
*LU3FP	*	408,340	968	58	112
*LU1AEE	*	95,580	226	61	119
***LRØH**	**28**	**1,026,564**	**2766**	**33**	**121**
			(Opr. LU9HS)		
***LU3HIP**	**"**	**923,904**	**2312**	**31**	**113**
***LU7EC**	**"**	**661,436**	**1774**	**29**	**113**
*LU7VCH	*	549,196	1730	29	95
*LU4FCZ	*	466,752	1371	30	106
*LW7EIC	*	307,424	1174	24	80
*LU9HOA	*	297,000	1069	26	82
*LU2EC	*	288,300	1115	24	76
*LU9MBY	*	258,875	719	27	98
*LU2HF	*	237,249	1034	23	64
*AY5E	*	199,232	847	23	65
			(Opr. LU5DV)		
*LW1EGD	*	169,924	813	24	68
*LW5HBR	*	142,222	790	23	71
*LW5EJU	*	135,405	620	22	63
*LU5HY	*	116,857	509	26	75
*LW6HAR	*	89,475	511	21	54
*LU5EVK	*	78,156	361	22	56
*LU5FSM	*	61,171	414	22	61
*LU9APM	*	50,640	319	19	40
*LU7VFJ	*	36,160	223	20	60
*LU4HUG	*	23,498	269	18	44
*LU9AWM	*	3,564	40	15	18
***LU5HCI**	**21**	**563,849**	**1429**	**35**	**108**
***LU2BA**	**"**	**454,350**	**1234**	**34**	**116**
*LU3FR	*	331,264	985	29	99
*LU1FNH	*	325,377	1061	28	89
*LU1HTF	*	246,309	840	28	83
*LU3ES	*	31,248	200	22	41
***LU2NI**	**14**	**708,344**	**1412**	**37**	**145**
***LU3MDO**	**"**	**623,840**	**1467**	**37**	**123**
*L44D	*	184,038	669	30	81
			(Opr. LU4DA)		
*LU6AMD	*	163,856	518	30	82
***LU4DX**	**7**	**90,896**	**364**	**27**	**77**
*LU2JCW	*	2,967	45	15	28
*LU6FBI	3.7	9,711	99	14	25
*LU8EEM	*	4,394	61	10	16
*LS9F	*	48	7	3	5
			(Opr. LU5FCI)		

ARUBA

P40W	**A**	**14,020,064**	**7291**	**153**	**535**
			(Opr. W2GD)		
P4ØB	**A**	**7,330,400**	**5946**	**109**	**331**
			(Opr. P43P)		
P43E	**A**	**4,689,410**	**3827**	**115**	**330**
P43T	*	4,261,602	3877	106	296
P43W	**28**	**889,267**	**2450**	**31**	**106**
P43A	**21**	**1,783,821**	**3904**	**31**	**128**
***P4ØN**	**28**	**959,728**	**2581**	**28**	**105**
			(Opr. W5AJ)		
*P4/W5AJ	3.7	41,797	314	12	37

BOLIVIA

CP6AA	**A**	**1,753,644**	**2140**	**101**	**216**
			(Opr. OH2XX)		

BRAZIL

PT7BZ	**A**	**4,910,400**	**3203**	**131**	**427**
PP1CZ	**"**	**2,158,404**	**2593**	**84**	**237**
PX2A	*	907,256	1501	74	164
			(Opr. PY2KP)		
PT2HF	*	208,840	379	60	170
PY2KQ	*	143,468	334	61	117
PS8HF	*	60,450	264	25	53
ZX2A	*	54,668	204	49	109
			(Opr. PT2ADM)		
PP8EB	*	44,520	146	45	75
PY5ADC	*	43,990	168	32	74
PS8NF	*	36,491	199	34	57
PP5CN	*	25,480	170	23	47
PY1HE	*	9,731	57	28	47
PY6KR	*	5,922	53	17	25
PT2CSM	*	1,271	28	16	22
ZX5J	**28**	**3,322,230**	**5392**	**39**	**183**
			(Opr. PP5JR)		
ZV2Z	**"**	**1,438,800**	**3090**	**34**	**142**
			(Opr. PY2ZP)		
PW2C	*	912,968	2916	38	158
PY2SBY	*	530,812	1619	31	100
PY2QD	*	82,896	391	26	62
PY1ACV	*	8,256	96	23	63
PU3WPA	*	4,140	47	16	20
ZX9A	**21**	**2,597,688**	**4291**	**38**	**180**
			(Opr. PY5CC)		
PQ5W	**"**	**1,225,070**	**2800**	**38**	**147**
			(Opr. PP5WG)		
ZZ2Z	*	306,750	783	35	115
			(Opr. PY2YP)		
PY3BD	*	149,158	489	27	80
PS7SAS	*	30,328	113	21	47
PY1ADV	14	62,424	283	28	74
***PQ2A**	**A**	**673,276**	**1168**	**80**	**201**
			(Opr. PY2ZX)		
***PY2NY**	**"**	**645,898**	**830**	**88**	**226**
***PY1KS**	**"**	**435,235**	**558**	**92**	**213**
*PY2DJ	*	201,620	554	60	110
*PY2RAF	*	124,245	367	55	110
*PY2OZF	*	122,880	381	47	73
*PP8EB	*	44,520	146	45	75
*PY1ZT	*	31,111	130	53	106
*PY2PI	*	23,370	135	32	50
*ZZ7Z	*	19,777	173	49	79
			(Opr. PR7AR)		
*PY3AJB	*	13,213	79	30	43
*PR7FMT	*	9,283	110	33	43
*PP5AM	*	7,168	44	26	38
*PY3FBI	*	4,945	105	28	35
***PY2XE**	**28**	**715,500**	**1673**	**34**	**125**
***PY2MNL**	**"**	**703,876**	**1732**	**31**	**118**
*PP5UA	"	538,890	2009	25	85
*PY5HSD	"	533,800	1536	30	106
*PU2YDX	*	340,487	1088	32	95
*PP5WN	*	242,064	772	30	93
*PU2MZI	*	149,765	776	19	58
*ZW3K	*	134,590	839	25	61
			(Opr. PY3RK)		
*PY2ELG	*	132,405	549	26	71
*PT7ZAA	*	70,448	363	21	53
*PP5VB	*	68,508	342	26	73
*PU2LQD	*	60,840	350	28	76
*PY5BF	*	20,532	112	23	64
*PY3CGP	*	20,286	170	20	43
*PY2EDY	*	19,458	125	22	47
*PY5DC	*	16,306	124	21	41
*PY5RSM	*	14,938	112	21	56
*PY1WAG	*	11,970	67	21	49
*PU2UIB	*	10,812	109	18	35
*PU2XLO	*	8,957	79	16	37
*PY5JO	*	4,356	67	15	29
*PY2EJN	*	4,212	33	12	27
*PU7EEL	*	4,171	61	17	26
*PU5YVO	*	4,030	75	14	17
*ZY2DX	*	3,488	63	12	20
			(Opr. PY2QE)		
*PU7ENW	*	3,168	37	16	28
*PU1KDR	*	3,128	72	7	10
*PS8ET	*	2,700	31	11	25
*PY3HSP	*	2,607	27	16	17
*PY3BM	*	2,072	74	14	14
*PY2TNT	*	1,992	30	10	12
*PY7BEL	*	1,519	45	14	17
*PY2XW	*	1,430	22	11	15
*PR7AYE	*	1,421	19	11	18
*PU8PY	*	252	7	5	7
			(Opr. PU8PYK)		
*PY2MYS	*	204	21	6	6
***PY2GY**	**21**	**124,020**	**449**	**27**	**90**
*PY2APQ	*	54,918	250	23	58
*PY2IQ/7	*	53,361	209	23	76
*PR2W	*	51,377	252	23	60
			(Opr. PT2AW)		
*PY2RIK	*	24,600	176	25	57
*PY2AER	*	3,094	41	11	23
*PY2TI	7	80	8	4	6

CHILE

XR3M	**A**	**1,338,350**	**1548**	**97**	**228**
			(Opr. W9FW)		
XR3W	**"**	**1,265,147**	**1615**	**93**	**214**
			(Opr. CE3WDH)		
XR8Y	**28**	**1,319,956**	**3481**	**39**	**102**
XR3Z	*	616,140	2043	25	83
			(Opr. NE4Z)		
***XQ5SM**	**A**	**846,192**	**1447**	**72**	**132**
***CE6TBN**	**"**	**769,482**	**1087**	**81**	**198**
*CE3CDV	*	70,056	200	48	91
***CE6DFY**	**28**	**112,200**	**629**	**19**	**49**
*CE4ETZ	*	2,100	25	10	20
*CE5BPE	*	1,539	28	14	13
*CE6NES	14	83,358	435	22	44

COLOMBIA

HK6KKK	**A**	**4,124,184**	**3534**	**118**	**360**
5K3W	28	16,275	277	10	11
HK3SGP	*	5,253	40	17	34
*HK6PSG	A	79,622	101	52	80
*HK6IUI	*	27,408	138	19	37
***HK3JJH**	**28**	**467,415**	**1504**	**26**	**91**
*HJ3PXA	*	210,654	914	27	67

ECUADOR

HC1JQ	**14**	**838,788**	**1924**	**35**	**129**
HD2R	*	344,331	1305	28	81
			(Opr. HC2GT)		
HD3W	7	2,541	40	11	22
			(Opr. HC3AP)		
***HC1OT**	**A**	**5,660,880**	**4405**	**112**	**346**
*HC1HC	28	14,175	317	7	8

FALKLAND ISLANDS

VP8CEH	**A**	**637,905**	**1131**	**62**	**153**
VP8ON	14	13,545	114	17	26

FERNANDO DE NORONHA

PTØF	**A**	**16,519,026**	**8172**	**156**	**562**
			(Opr. N5FA)		

GALAPAGOS ISLANDS

HC8A	**A**	**17,055,106**	**8955**	**161**	**501**
			(Opr. N6KT)		

GUYANA

8R1K	**14**	**1,719,836**	**3469**	**37**	**141**
			(Opr. N5ZO)		

PARAGUAY

ZP5XF	**28**	**1,445,425**	**3075**	**36**	**143**
			(Opr. LU7DW)		
ZP6CC	*	247,132	875	32	92
ZP6T	**21**	**863,590**	**2115**	**35**	**134**
			(Opr. ZP5MAL)		

TRINIDAD & TOBAGO

9Y4VU	**21**	**1,804,386**	**3404**	**36**	**150**
9Y4NZ	**14**	**981,776**	**2181**	**37**	**135**

URUGUAY

CX2ABC	A	109,848	501	28	64

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CX7CC	*	54,390	219	54	93
CX6VM	*	735	15	11	10
CX8CP	**28**	**1,513,691**	**3893**	**32**	**117**
CX5X	**"**	**1,451,680**	**2989**	**33**	**139**
					(Opr. CX6VM)
CV4Y	*	1,327,885	3233	34	121
CX4BAD	*	535,800	1968	23	77
CV1A	*	455,936	1510	29	99
CX7BF	*	269,705	1155	23	72
CX7BY	**21**	**831,270**	**1813**	**36**	**129**
CX2SA	**14**	**199,038**	**517**	**35**	**112**
***CX9AU**	**A**	**817,966**	**1121**	**98**	**236**
***CX8BAE**	**28**	**273,945**	**1073**	**27**	**78**
*CX5BE	*	178,220	887	24	71
*CX7DA	*	101,708	443	22	72

VENEZUELA

***4M5E**	**A**	**1,184,352**	**1436**	**80**	**258**
					(Opr. YV5NWG)
*YV5JBI	*	240,588	513	51	112
*YV7QP	*	73,168	199	44	92
***YY4GLF**	**28**	**101,640**	**679**	**24**	**46**
*YY4GMB	*	7,488	99	15	24
***YW3B**	**21**	**119,171**	**782**	**22**	**81**
					(Opr. YV3BKC)
***YV5DZQ**	**7**	**114,048**	**431**	**21**	**75**

QRP

N6MU	**A**	**621,264**	**666**	**106**	**238**
YU1KN	**"**	**575,600**	**892**	**87**	**313**
K2PS	**"**	**524,901**	**618**	**79**	**234**
LU1VK	**"**	**518,169**	**797**	**81**	**168**
NØKE	**"**	**499,280**	**623**	**102**	**214**
JR4DAH	**"**	**419,482**	**605**	**89**	**177**
EA1GT	**"**	**304,792**	**632**	**58**	**190**
LY2FE	**"**	**287,532**	**736**	**53**	**241**
JA2DLM	**"**	**270,336**	**455**	**95**	**169**
YU1LM	**"**	**269,325**	**737**	**58**	**227**
S59D	**"**	**253,270**	**555**	**76**	**234**
HA7YS	**"**	**251,085**	**605**	**62**	**223**
W6YJ	**"**	**230,144**	**382**	**84**	**148**
N1TM	**"**	**189,210**	**324**	**60**	**178**
W8QZA/6	**"**	**149,580**	**317**	**70**	**110**
NØFW	**"**	**135,870**	**258**	**66**	**144**
SM3CCT	**"**	**122,304**	**406**	**46**	**178**
UA9SG	**"**	**121,875**	**302**	**57**	**138**
WA3NKO	**"**	**118,164**	**290**	**45**	**127**
N4IJ	**"**	**117,950**	**305**	**55**	**120**
RW9AB	*	115,900	385	25	97
OK1DKS	**"**	**93,312**	**292**	**46**	**146**
IK5RUN	**"**	**85,100**	**241**	**68**	**162**
RZØSR	**"**	**80,432**	**211**	**65**	**111**
UAØKCL	*	80,250	263	49	76
NQ7X	**"**	**70,680**	**207**	**45**	**79**
IØKHP	*	70,020	244	47	133
HB9AYZ	**"**	**55,875**	**243**	**40**	**109**
SP1MVG	**"**	**50,728**	**261**	**30**	**106**
KRØI	*	45,990	142	45	81
RXØSD	*	42,532	186	42	82
I3MDU	*	38,912	185	34	94
ON7CC	**"**	**34,914**	**200**	**32**	**106**
NM1K	*	34,684	117	35	81
CT1ETT	**"**	**32,544**	**197**	**30**	**83**
9A2EY	**"**	**32,207**	**199**	**82**	**107**
WA5OJI	**"**	**30,780**	**127**	**32**	**76**
SP4CQU	*	30,090	113	39	79
W3TT	*	29,640	107	40	74
					(Opr. N9GG)
YO4AAC	**"**	**26,433**	**191**	**27**	**72**
IØYQV	*	24,645	142	29	64
JN2FSE	*	23,275	108	35	60
N8XA	**"**	**23,236**	**152**	**57**	**94**
KH6/WB6FZH	**"**	**22,669**	**202**	**54**	**69**
RV3AR	**"**	**22,143**	**97**	**44**	**77**
K5OI	*	21,560	136	30	40
JA4AKN	**"**	**14,367**	**88**	**24**	**39**
AF9J	*	7,245	56	29	34
YO2LGX	*	3,486	76	9	33
EA1II	*	3,417	72	9	42
SP5NHI	*	3,080	42	17	38
LA9PJA	*	1,702	40	5	32
JA8CSL/1	*	432	12	7	11
KD7BMC	*	100	70	29	32
KP4FP	**28**	**511,212**	**1935**	**25**	**91**
LW3DWX	**"**	**69,237**	**441**	**15**	**48**
EA2AWF	**"**	**65,817**	**229**	**23**	**80**
W9JUV	**"**	**40,986**	**174**	**20**	**61**
JA1MYW	**"**	**22,082**	**133**	**22**	**39**
LU2HNP	*	20,160	215	24	46
JH3DMQ	**"**	**16,695**	**117**	**19**	**34**
KA8NRC	**"**	**15,194**	**137**	**19**	**52**
LU7WW	*	13,317	86	22	47
OK1GW	**"**	**10,229**	**93**	**15**	**38**
JL3SBE	*	8,650	83	19	31
JA1YYA	*	8,372	73	17	29
					(Opr. JM1IXB)
HAØGK	**"**	**8,055**	**79**	**14**	**31**
JA3LFK	*	7,236	91	10	17
PU2TNK	*	4,410	52	17	25
EW6DI	*	2,945	74	8	23
JR3NDZ/1	*	1,736	26	11	17
T9/K3TW	*	770	18	8	14
N7VY	**21**	**54,984**	**258**	**26**	**61**
UR5MTA	**"**	**29,726**	**211**	**19**	**70**
JR1NKN/2	**"**	**21,460**	**159**	**21**	**37**
EA2BTO	**"**	**8,721**	**82**	**13**	**38**
JQ6PAQ	*	5,203	57	15	28
DL1DQY	*	782	20	8	15
N4EUK	*	117	6	4	5
RK4SWF	**14**	**56,810**	**286**	**27**	**88**
					(Opr. UA4SKW)
W6CN	**"**	**39,072**	**166**	**31**	**57**
SP9EWO	**"**	**31,816**	**280**	**20**	**62**
JA7ICX/1	*	564	23	10	14
LU1HN	*	544	37	11	21
JA6GCE	**7**	**31,195**	**146**	**24**	**61**
IK8HOE	*	1,302	40	5	26
SP4GFG	**3.7**	**6,713**	**118**	**8**	**41**
SP3J	**"**	**5,320**	**132**	**5**	**35**
					(Opr. SP3NGB)
OK1AIJ	**"**	**3,330**	**88**	**5**	**32**
VY2MGY/3	*	732	77	4	2
JA1AA	*	420	12	9	11
P4ØN	*	3	2	1	2
YO4FRF	**1.8**	**2,240**	**72**	**5**	**23**
P4ØN	*	91	5	2	5

ASSISTED

UNITED STATES

K1ZM	**A**	**5,168,493**	**2547**	**165**	**582**
KI1G	**"**	**4,335,610**	**2282**	**149**	**573**
KS1L	**"**	**4,088,666**	**2370**	**138**	**496**
K1VR	**"**	**2,861,712**	**1592**	**147**	**521**
W1NG	*	2,563,040	1457	143	521
N1DG	*	1,837,996	1160	135	472
W1RZF	*	1,614,150	1255	110	400
AA1V	*	1,559,790	1110	119	411
K1MY	*	1,465,893	1002	126	435
K1AM	*	1,384,938	1037	117	381
KZ1M	*	1,301,724	1066	105	354
KA1CLX	*	1,298,897	944	111	388
K1MO	*	1,244,600	917	109	381
N8RA/1	*	1,229,760	894	115	389
NQ1K	*	1,100,121	696	126	457
WF1B	*	1,091,584	1032	97	319
N1DD	*	987,784	839	105	329
AD1C	*	937,710	760	102	351
N1NQD	*	911,000	697	123	377
W1JR	*	631,496	581	105	304
K1SM	*	572,234	607	83	255
K1VV	*	551,232	626	80	268
K1TH	*	517,588	589	76	256
W1BIH	*	495,299	494	104	305
KK1DX	*	467,964	478	95	283
K1RV	*	446,875	509	80	245
K1GE	*	360,052	449	90	218
KC1F	*	326,570	414	73	216
K1EO	*	323,932	400	78	244
KD1KI	*	301,938	454	76	218
N1JP	*	285,180	457	70	221
K1KU	*	246,600	379	73	201
K1SF	*	246,404	324	70	199
K2AJY/1	*	237,168	274	79	245
KV1J	*	237,160	369	64	181
KA1GJ	*	217,800	352	77	198
N4XR/1	*	174,351	271	78	189
W1AO	*	168,142	310	61	162
K1TR	*	148,950	256	65	160
K1SD	*	128,106	247	55	143
NC1N	*	85,491	187	49	128
N1RL	*	64,436	152	65	113
KT1M	*	54,128	162	42	94
NZ1Q	*	32,996	131	41	72
K1ST	*	26,568	87	36	72
N1KO	*	3,854	43	15	26
W1GD/2	**A**	**2,867,834**	**1623**	**139**	**502**
K5KG/2	**"**	**2,714,067**	**1539**	**145**	**512**
W2RE	**"**	**2,576,988**	**1638**	**145**	**497**
K2XA	*	2,413,166	1327	150	529
W2TV	*	1,409,072	976	125	422
W2YC	*	1,202,815	1090	123	422
N2BIM	*	1,181,565	877	115	380
W2YR	*	1,151,750	797	125	417
K2ONP	*	999,380	825	113	354
KC6ETY/2	*	841,468	821	102	320
K2XF	*	742,677	677	105	306
AA2DY	*	675,200	669	91	309
K2BX	*	645,813	693	87	270
K2QMF	*	639,996	588	98	303
K2EP	*	568,405	550	91	304
WB2WPM	*	524,112	519	89	277
W2GDJ	*	469,455	545	97	260
N2KJM	*	407,962	521	78	220
KN2M	*	403,025	481	91	252
K2FL	*	357,429	461	71	212
WK2H	*	240,318	410	60	174
K2ZP	*	49,623	159	43	96
K2ZQ	*	39,729	123	38	85
K2KQ	*	22,458	85	41	73
KF2O	*	11,122	51	35	48
KA2CIW	28	7,250	48	18	35
K2WJ	**7**	**43,359**	**171**	**20**	**77**
K3WW	**A**	**3,488,265**	**1769**	**153**	**576**
K3NZ	**"**	**3,161,220**	**1655**	**151**	**557**
N3AD	**"**	**2,758,920**	**1628**	**151**	**513**
W3EEE	*	2,521,766	1546	132	466
AA3B	*	2,228,255	1362	127	486
NN3Q	*	1,990,856	1266	126	458
N3MKZ	*	1,981,968	1209	133	495
K3ND	*	1,822,824	1158	133	449
AA3JU	*	1,341,886	1106	115	396
N3ZA	*	1,298,313	886	125	418
KB3TS	*	1,160,280	922	112	383
K3AR	*	1,133,640	771	123	413
W3CC	*	976,212	735	110	414
K3CP	*	860,626	774	96	323
KE3VN	*	824,208	743	110	352
W3IZ	*	749,904	769	99	309
N3II	*	618,192	559	108	316
W3OV	*	594,440	607	97	288
KB3AUG	*	586,749	563	94	299
W3HVQ	*	575,230	592	108	302
K3BSA	*	546,820	598	97	283
KU3X	*	512,694	586	82	231
K3KFD	*	487,944	598	81	243
K3KNH	*	429,975	510	81	270
K3IXD	*	357,884	421	82	241
N3NT	*	319,800	432	87	225
W3KV	*	288,768	408	65	191
N3GPU	*	239,280	394	63	177
KF3BE	*	172,140	319	60	168
N3QQ	*	114,240	247	57	135
AA3LX	*	82,824	195	60	108
NE3H	*	53,784	170	51	115
W8FJ/3	*	49,248	142	44	100
KQ3F	*	49,206	130	49	90
K3TG	*	22,092	96	27	57
N3RS	**28**	**469,030**	**1002**	**33**	**145**
N3RD	**21**	**994,850**	**1900**	**37**	**160**
WR3L	*	120,060	321	32	113
K4MA	**A**	**2,454,293**	**1435**	**153**	**508**
N4ZC	**"**	**2,245,884**	**1350**	**153**	**480**
N2QT/4	**"**	**2,016,152**	**1276**	**136**	**468**
AA4R	*	1,479,345	951	141	438
N4PQX	*	896,564	644	128	396
KQ4QM	*	748,572	695	107	321
W4FDA	*	545,592	565	101	280
NT4D	*	310,992	407	84	220
N4DW	*	282,012	401	78	206
K4FPF	*	262,361	375	62	191
W4WNT	*	156,978	276	72	171
K4SO	*	135,420	236	56	166
W4UFO	*	121,878	209	71	151
KB4WPL	*	104,940	180	73	139
K2SD/4	*	32,868	111	46	86
N4XMX	*	10,336	52	30	46
KR4XM	*	8,700	50	21	39
W4PJV	*	7,452	51	28	41
KO4MR	**28**	**62,436**	**178**	**30**	**99**
KF4YOQ	*	5,670	50	16	26
N4GU	**21**	**154,080**	**423**	**32**	**112**
K4DN	**7**	**51,920**	**177**	**30**	**88**
KD4RH	*	44,940	173	26	81
N5JR	**A**	**1,700,015**	**1209**	**127**	**388**
K5NA	**"**	**1,601,726**	**1048**	**150**	**449**
N5TW	**"**	**1,130,652**	**873**	**137**	**376**
N5KB	*	468,138	555	101	245
K2FF/5	*	190,314	289	93	198
KZ5E	*	125,550	266	76	149
K5AM	*	119,244	236	79	149
K4NR/5	*	94,200	189	67	133
WM9M/5	*	38,760	148	25	77
KM5FA	**28**	**151,765**	**583**	**29**	**98**
AA5XE	**21**	**189,483**	**456**	**30**	**117**
NT5C	**7**	**38,383**	**108**	**31**	**100**
K6ACZ	**A**	**178,220**	**277**	**84**	**184**
NK6A	*	68,880	208	38	85
K6JG	*	55,279	140	51	98
N6EE	*	39,646	171	24	62
W6ISQ	*	38,745	92	46	89
N6ND	**28**	**325,666**	**926**	**32**	**99**
W7OM	**A**	**815,121**	**881**	**112**	**257**
K7ABV	**"**	**370,872**	**451**	**96**	**207**
W7NN	*	317,512	416	90	194
W7CT	*	162,131	305	70	127
WO7T	*	20,737	233	34	55
K8EI/7	*	9,882	65	34	47
KD7CPO	*	4,773	53	14	23
K7WP	28	40,677	171	26	65
W7VV	**14**	**144,354**	**355**	**36**	**111**
N8TR	**A**	**1,756,340**	**1008**	**155**	**530**
N8RF	**"**	**1,039,008**	**842**	**112**	**362**
WZ8A	*	295,902	446	84	222
NC8V	*	257,920	455	85	225
KA8PTT	*	144,560	290	58	150
WG8H	*	45,120	150	51	90
W8IMF	*	17,864	73	34	54
N9UA	**A**	**807,631**	**814**	**107**	**304**
WO9Z	**"**	**630,801**	**640**	**98**	**285**
KB9BUM	*	507,928	534	98	269
W9ZP	*	450,566	541	89	245
W9GIG	*	348,648	365	104	294
N9XX	*	119,198	225	75	139
WØGJ	**A**	**796,194**	**779**	**137**	**360**
N5IN/Ø	*	526,875	616	109	266
KKØDX	*	118,352	231	75	133
KIØLO	*	115,206	243	67	115
KNØL	*	28,749	110	40	71

BARBADOS

8P6SH	**A**	**3,029,400**	**3595**	**98**	**298**

CANADA

VA3DX	**A**	**1,341,015**	**1096**	**128**	**379**
VE9FX	*	367,212	543	68	216

ASIA

ASIATIC RUSSIA

RAØFF	**A**	**732,172**	**1118**	**126**	**205**

JAPAN

JE3HDD	**A**	**1,040,709**	**1075**	**117**	**271**
JH8SLS	**"**	**649,054**	**743**	**115**	**243**
JQ1BVI	*	603,314	874	95	181
JA6SRB	**"**	**512,892**	**629**	**102**	**222**
JA9XBW	**"**	**511,395**	**608**	**114**	**217**
JAØBMS/1	*	176,300	403	57	107
JM3XEJ	*	163,682	320	80	143
JJ6TYG	*	97,960	245	56	102
JP1SPV	*	91,371	251	47	86
JA2VHO	*	88,404	231	43	96
JA7SUR	*	62,378	210	50	82
JG7AMD	*	42,256	122	62	90
JAØHYU	*	29,493	109	44	69
7K1SLY	*	19,710	87	38	52
JE2FRZ	*	3,440	30	16	27
JA7OWD	**28**	**297,360**	**964**	**36**	**69**
JG3KIV	**"**	**123,760**	**487**	**36**	**68**
JE9LLO	*	18,960	129	23	37
JF1LLT	**21**	**171,935**	**517**	**36**	**101**
JA9SCB/1	*	65,124	249	33	75
JE9PFD	*	42,230	198	25	57
JF1SQC	**14**	**95,760**	**260**	**36**	**97**
JQ1NGT	*	26,398	157	25	42

EUROPE

AUSTRIA

OE8SKQ	**A**	**2,685,358**	**2679**	**129**	**448**
OE2CZN	*	79,456	230	56	135
OE1TKW	*	57,072	183	55	109

BELGIUM

ON5GQ	**A**	**1,046,994**	**1063**	**103**	**330**
ON4CAS	*	77,520	188	52	100
ON4MA	**28**	**158,916**	**480**	**29**	**135**

CZECH REPUBLIC

OL6X	**A**	**2,271,368**	**2278**	**128**	**455**
					(Opr. OK1DIG)
OK2FD	**"**	**2,174,589**	**1731**	**139**	**560**
OK1TN	*	774,144	872	104	328
OK1DXW	"	265,362	540	69	213
OK1DWC	*	82,468	184	74	138

EUROPEAN RUSSIA

UA6LP	A	25,908	93	48	79

FINLAND

OH6NIO	**A**	**993,010**	**1085**	**112**	**387**
OH8BQT	*	321,300	647	75	225
OH2LU	*	306,280	578	77	233
OH5BM	**21**	**416,724**	**1150**	**36**	**128**
OH3BU	3.7	1,953	54	6	25
OH2BO	1.8	3,612	59	7	35

FRANCE

TM2V	**A**	**4,670,048**	**3260**	**131**	**477**
					(Opr. F6GYT)
F5FLN	**28**	**363,558**	**1240**	**32**	**126**

GERMANY

DLØWW	**A**	**4,358,410**	**2686**	**160**	**631**
					(Opr. DK3GI)
DJ2YA	**"**	**2,445,801**	**1511**	**140**	**559**
DL1MFL	**"**	**1,881,124**	**1543**	**128**	**516**
DL5RBK	*	1,371,875	1051	135	490
DK9DA	*	1,200,980	1095	114	416
DL5IC	*	786,040	824	109	348
DL4NN	*	607,867	711	102	335
DJ9MH	*	604,656	709	107	361
DF6QN	*	593,880	791	85	307
DL2KUW	*	542,984	727	97	357
DL7NFK	*	372,222	591	80	259
DLØEK	*	372,044	572	76	255
					(Opr. DL1GST)
DJ8CR	*	339,768	642	79	272
DL8AAM	*	246,528	589	58	230
DF2UU	*	226,010	462	70	163
DJ8QP	*	219,184	348	82	222
DK7ZT	*	103,936	189	75	181
DL8NBE	*	96,472	332	60	188
DLØTU	*	25,370	103	45	73
DL8OH	**28**	**156,600**	**440**	**34**	**146**
DL3ARK	*	25,564	154	21	56
DL3NCI	**21**	**222,332**	**642**	**36**	**127**

ITALY

IO4A	**A**	**2,103,696**	**1965**	**108**	**396**
					(Opr. IK4PVR)
IN3ZNR	**"**	**1,707,198**	**1489**	**131**	**403**
IK1SLE	*	1,378,074	1406	111	367
IK1RLI	*	700,876	936	88	286
I4TJE	**28**	**515,090**	**1290**	**35**	**155**
IV3FSG	**21**	**283,497**	**780**	**35**	**124**
IK5WGK	7	5,888	92	8	38
IC8JAH	3.7	12,716	330	11	57

LUXEMBOURG

LX1TI	**A**	**846,380**	**1558**	**94**	**325**

NETHERLANDS

PA3DMH	A	10,650	105	23	48
PAØJED	28	9,130	100	13	42
PAØMIR	**3.7**	**24,830**	**309**	**9**	**57**

NORWAY

LA8ZJA	A	18,336	93	29	67

POLAND

SP9LAS	A	101,752	227	55	129
SP6OJJ	*	25,272	76	48	69
SP9W	**21**	**273,240**	**1042**	**38**	**142**
SP2PMO	**14**	**459,610**	**1311**	**38**	**152**
					(Opr. SP2JKC)

SICILY

IT9JOF	**A**	**1,041,854**	**1235**	**97**	**222**
IQ9K	*	246,568	597	70	189

SLOVENIA

S57S	**A**	**2,547,000**	**2373**	**133**	**467**
S56A	**"**	**1,141,984**	**1022**	**122**	**440**
S58MU	*	148,421	465	56	177
S57IIO	*	97,299	322	46	125
S52U	*	77,280	229	49	112
S51AY	**28**	**277,952**	**777**	**33**	**139**

SPAIN

EA7DHP	**A**	**1,062,150**	**1378**	**92**	**273**
EA3BHK	**"**	**837,672**	**783**	**120**	**381**
EA2ATV	*	740,019	830	95	298
EA5WI	*	554,484	783	76	200
EA3SD	*	357,291	609	77	220
EA2AHP	**28**	**108,240**	**371**	**29**	**94**
EC5CON	**21**	**110,780**	**694**	**25**	**91**
EA3GEP	14	48,238	347	18	71
EA3KA	3.7	15,246	221	9	54

SWEDEN

SM2EKM	**A**	**1,074,073**	**1342**	**106**	**271**
SK5EW	*	516,465	1006	77	268
					(Opr. SM5IMO)

UKRAINE

UT7I	**14**	**647,870**	**2156**	**39**	**146**
					(Opr. UT2IO)

WALES

GWØRYT	**A**	**200,799**	**582**	**50**	**151**

YUGOSLAVIA

YU7KMN	**21**	**286,704**	**912**	**33**	**99**
YZ7ED	**7**	**133,170**	**540**	**28**	**110**

OCEANIA

HAWAII

KH6/N7FL	A	273,156	715	61	95

SOUTH AMERICA

BRAZIL

PT2HO	**A**	**512,460**	**783**	**73**	**187**
ZZ5G	**28**	**1,885,996**	**3994**	**38**	**155**
					(Opr. PY5GU)

VENEZUELA

YV5NKV	**A**	**172,038**	**870**	**28**	**78**

MULTI-OPERATOR SINGLE TRANSMITTER NORTH AMERICA

UNITED STATES

KC1XX	**8,728,040**	**3629**	**169**	**726**
K1RO	**4,547,067**	**2338**	**159**	**580**
WA1RR	1,646,925	1345	122	403

WV1M	1,273,972	972	125	401
W1W	1,167,018	819	125	426
W1HR	971,280	842	111	345
N1TB	858,855	726	106	359
N1AU	819,123	750	94	317
N1SP	637,884	618	82	295
N1AO	526,125	677	85	260
WO1N	383,940	478	79	237
N1SOH	339,167	491	69	212
N1IA	179,850	313	57	161
KC1AL	6,018	59	20	31
N2NU	**6,702,771**	**3007**	**168**	**671**
K2NG	**3,929,130**	**2064**	**155**	**590**
K2TR	**3,777,430**	**2123**	**158**	**599**
K2KV	2,825,452	1729	142	516
W6XR/2	1,997,775	1412	139	446
N2ZX	1,802,112	1226	138	470
K2XR	1,635,760	1421	128	432
AB2DE	932,176	735	110	354
K2OWE	901,461	792	107	356
N2LBR	806,256	766	91	305
W2LC	803,110	787	98	287
KG2BN	469,478	673	95	287
AE2F	240,864	323	89	223
KF2XK	219,045	395	72	183
W2SEX	154,124	288	60	152
W2CXM	137,546	273	54	140
KG2FH	101,024	225	51	113
K3TUP	**3,202,710**	**1787**	**156**	**551**
N3DL	**3,057,690**	**1855**	**147**	**534**
K3OO	2,564,349	1620	133	458
W3GNQ	2,239,808	1489	139	493
W3MF	1,950,282	1285	125	457
NE3F	1,929,870	1349	139	476
N1WR/3	1,223,600	992	112	363
K1DQV/3	1,077,949	926	129	392
W3DXR	813,510	802	102	291
K4ISV	**4,928,232**	**2645**	**174**	**597**
N4TO	**4,775,592**	**2470**	**165**	**607**
N4RV	2,612,586	1462	147	526
N8PR/4	2,026,934	1564	145	457
W4NC	1,724,752	1213	135	443
K1TO/4	1,161,594	1005	111	330
K4VUD	867,792	983	116	288
W4CAT	766,938	767	122	316
K4RC	492,385	616	92	263
K4KDJ	244,035	372	69	186
W4SAR	158,184	322	66	168
W2DO/4	97,745	243	58	115
K5MR	**4,443,810**	**2483**	**175**	**560**
NA5B	**2,047,200**	**1914**	**134**	**346**
N5HRG	1,547,232	1086	146	422
AA5NT	1,379,460	1083	136	362
K5MDX	1,197,324	997	124	350
K5GN	725,908	850	103	243
N5CMI	519,305	698	98	269
NJ5S	270,630	426	80	199
N5WNL	200,420	351	72	148
KG6OK	**2,002,572**	**1693**	**135**	**333**
W6EEN	**1,851,656**	**1619**	**137**	**335**
AF6P	412,915	913	98	171
N6IJ	331,542	584	78	148
KG6MO	290,604	503	81	163
NK7U	**3,878,000**	**2575**	**150**	**410**
KC7V	**2,908,581**	**2110**	**153**	**380**
K7ON	701,142	928	89	214
W7IG	485,604	724	87	195
N7KQ	406,272	765	83	173
N7IP	45,339	164	52	67
K8AZ	**4,660,446**	**2437**	**165**	**612**
W9LT/8	**3,229,665**	**1791**	**152**	**543**
N8NR	**3,166,800**	**1713**	**155**	**541**
AA8U	2,873,475	1728	153	522
KB8TI	1,671,736	1251	114	370
W8PLP	15,624	87	34	50
KC8KUQ	4,784	88	15	31
W9JA	**4,879,400**	**2454**	**173**	**602**
KD9ST	970,641	903	123	318
WN9O	765,264	754	108	320
NØNI	**3,161,442**	**1815**	**170**	**543**
KØDU	**3,065,456**	**2120**	**154**	**412**
WØTM	1,291,248	1206	125	316
NØIJ	887,292	843	118	323
NP2N/WØ	492,435	617	98	255

BAHAMAS

C6A/KI6T	**794,384**	**1547**	**78**	**184**

BRITISH VIRGIN ISLANDS

VP2V /K7AR	**7,697,415**	**5645**	**134**	**471**

CANADA

VE7SZ	**4,493,940**	**4281**	**136**	**348**
VO2WL	**3,229,914**	**3546**	**103**	**328**
VE6SV	**3,126,057**	**3290**	**131**	**342**
VA3SK	**2,759,746**	**2704**	**123**	**394**
VE2CSI	**2,463,537**	**2864**	**95**	**294**
VE5SF	**2,036,156**	**3259**	**100**	**232**
VE6FI	1,991,592	2372	119	298
VE6AO	740,925	1369	92	175
VO2CQ	474,726	802	72	195
VE2CQW	286,230	824	60	150
VE3DC	159,960	427	68	147
VE3MIS	133,480	334	51	137
VE9WH	23,226	117	37	61

COSTA RICA

TI5WFM	**4,642,632**	**4964**	**111**	**297**

CUBA

CO2BCC	**486,342**	**1860**	**29**	**94**

DOMINICAN REPUBLIC

HI8/DK8YY	**7,673,120**	**6921**	**124**	**396**
HI3/DN4ANT	1,519,872	3171	78	178

GUADELOUPE

FG5BG	**12,042,342**	**8214**	**146**	**543**

GUANTANAMO BAY

KG4CM	**1,899,916**	**3412**	**83**	**191**

MARTINIQUE

FM5BH	**8,752,416**	**5827**	**147**	**545**
TO8B	3,588,981	4735	88	275

PANAMA

3E1DX	**6,438,663**	**6214**	**128**	**361**

PUERTO RICO

WP3A	**5,324,500**	**5408**	**127**	**373**

TURKS & CAICOS ISLANDS

VP5DX	**7,455,210**	**5511**	**146**	**509**

U.S. VIRGIN ISLANDS

WP2Z	**7,662,924**	**5951**	**130**	**473**
NP2B	4,731,949	5237	108	323

AFRICA

CANARY ISLANDS

EA8ZS	**9,313,670**	**5157**	**138**	**532**
EA8NL	1,152,823	1337	81	262

GAMBIA

C56T	**19,118,437**	**8602**	**162**	**631**

MADEIRA ISLANDS

CQ9K	**8,351,488**	**5653**	**141**	**505**

ASIA

ARMENIA

EK8WV	276,816	665	36	110

ASIATIC RUSSIA

RK9CWW	**5,264,325**	**3102**	**149**	**526**
RZ9AZA	**4,461,414**	**2948**	**129**	**484**
RK9CZO	1,187,736	1281	87	276
RK9SXB	802,572	1021	68	214
RZ9AZN	735,376	1039	73	255
RK9SWF	600,160	708	90	262
RK9AWN	388,890	589	73	217

CHINA

B4R	**1,345,283**	**2560**	**108**	**245**
BY2HIT	238,587	946	74	127
BY2JCY	39,185	322	34	51

INDIA

VU2JNA	**2,038,491**	**1976**	**99**	**300**
VU2WAP	**2,032,646**	**2045**	**115**	**354**

JAPAN

JH7PKU	**5,060,312**	**3170**	**160**	**444**
JAØYAK	**3,105,540**	**2306**	**142**	**344**
JR1ZTT	**3,028,186**	**2450**	**148**	**363**
JE6ZIH	**2,491,584**	**2319**	**134**	**322**
JA1ELY	2,004,474	1816	137	302
JI2ZJS	**1,901,694**	**1772**	**137**	**316**
JH7AFR	1,895,316	2265	113	241
JI2ZEY	1,637,766	1908	111	240
JA9YAA	**1,350,387**	**1464**	**133**	**314**
JA6ZLI	1,291,971	1267	112	269
JA9YBA	1,145,242	1404	111	247
JI3BFC	535,248	600	117	237
JF2FIU	83,776	277	51	68
JA2YKA	17,316	111	32	42
JA1YGX	416	29	10	16

KAZAKHSTAN

UPØL	**5,397,449**	**3602**	**140**	**489**

OMAN

A45ZN	**3,928,842**	**3091**	**110**	**391**

SAUDI ARABIA

HZ1AB	**1,368,062**	**1352**	**92**	**305**

SINGAPORE

9V1YC	**3,723,002**	**3716**	**123**	**393**

THAILAND

HSØAC	**852,398**	**1671**	**100**	**258**

EUROPE

4U-GENEVA

4U1ITU	**4,932,739**	**4354**	**143**	**564**

4U-VIENNA

4U1VIC	**2,127,962**	**2976**	**119**	**432**

AUSTRIA

OE5T	**1,564,959**	**1794**	**107**	**410**
OE3I	895,788	1105	113	388

AZORES

CU2V	**6,346,475**	**5944**	**108**	**367**

BELGIUM

OT8L	**2,961,126**	**2532**	**128**	**511**
OT8P	**2,857,391**	**2635**	**124**	**481**
OT8C	**2,592,840**	**2562**	**127**	**488**
OT8K	1,150,623	1530	106	413
OT8R	208,692	793	70	236

BULGARIA

LZ9A	**4,935,801**	**3932**	**157**	**584**
LZ1KSN	227,702	644	66	191

CROATIA

9A7A	**5,938,326**	**3839**	**159**	**635**
9A9D	1,832,379	2192	115	412
9A2L	1,407,150	1518	120	411
9A5D	1,053,828	2007	94	307
9A7P	765,400	1180	91	339

CZECH REPUBLIC

OK5W	**6,670,332**	**4150**	**167**	**667**
OL5T	**3,050,432**	**2633**	**135**	**569**
OL5Q	1,335,600	2035	100	324
OK2KDS	727,590	999	91	304
OL2A	709,716	1111	102	324
OK2KOD	692,012	963	106	346
OK1KUO	434,232	771	68	265
OL6A	356,536	625	75	253
OK1KCF	63,175	265	40	135

DENMARK

OZ7HAM	**727,610**	**1714**	**75**	**302**
OZ7HVI	144,160	454	58	207

ENGLAND

M8P	**3,877,740**	**2698**	**133**	**535**
G8Q	**895,455**	**1525**	**91**	**314**
G8B	653,616	1021	89	319
G8Y	344,520	653	67	230
M8G	268,926	627	64	202
M8S	165,636	488	50	164

ESTONIA

ES5Q	**3,540,765**	**3214**	**147**	**538**

EUROPEAN RUSSIA

RM6A	**5,774,440**	**4122**	**164**	**656**
UD6M	**4,757,428**	**3667**	**166**	**598**
RN4W	3,026,160	2748	145	503
RN3R	1,245,198	1841	114	360
RK4HYT	851,000	1228	109	351
RA3AA	678,678	1125	99	330
RK3YYM	356,568	814	82	276
RK6XWY	5,616	59	18	34

FINLAND

OH1AF	**4,121,040**	**3049**	**151**	**619**
OH7AAC	**3,085,101**	**2570**	**151**	**550**
OH7AB	2,209,320	1779	160	562
OH6AW	1,263,904	1657	119	389

FRANCE

TM2Y	**10,381,027**	**5158**	**168**	**695**
TM1C	**7,456,080**	**4815**	**151**	**601**
TM3A	2,872,518	2658	124	489
F8KCF	2,019,006	1886	119	475

GERMANY

DFØHQ	**6,554,754**	**4059**	**162**	**679**
DHØDX	**4,003,623**	**2976**	**137**	**604**
DF3CB	**3,983,100**	**2636**	**149**	**632**
DLØAO	1,958,672	1819	133	513
DFØAT	1,920,116	1677	120	458
DFØHTE	1,579,388	1673	114	428
DL2DBH	1,213,114	1478	106	405
DK4QT	913,965	1026	114	431
DK6QW	689,896	1166	85	247
DF4SA	369,952	653	89	263
DKØPI	293,410	820	58	247
DLØTS	146,985	613	45	160
DL9LR	72,000	314	36	124
DN1MA	34,568	139	47	102

HUNGARY

HG1S	**8,234,800**	**5964**	**168**	**697**
HA3KNA	2,041,848	2248	118	434

ICELAND

TF3IRA	**138,336**	**720**	**31**	**101**

ITALY

IR4T	**10,063,075**	**5048**	**178**	**747**
IR1A	**3,548,691**	**2695**	**141**	**540**
IO2A	3,467,484	2716	144	588
IO2L	1,325,505	1452	108	377
IR3P	1,252,410	1230	123	422
IK4QJM	472,656	749	84	260
IV3RAV	140,420	325	69	167
IU2C	131,000	343	62	138
IZ3ALM	28,800	182	43	107

LATVIA

YL8M	**3,069,020**	**3195**	**150**	**542**

LITHUANIA

LY/K4ZLE	**2,077,506**	**2902**	**122**	**425**
LY3AV	1,157,820	1714	102	358
LY2OM	570,240	1136	80	304
LY3MV	107,694	434	45	141

LUXEMBOURG

LX2LX	**1,275,166**	**1766**	**96**	**341**

MALTA

9H3WD	**698,400**	**1165**	**86**	**314**

NETHERLANDS

PA3DWD	**2,621,108**	**2567**	**126**	**496**
PI4CC	**2,199,085**	**2318**	**126**	**455**
PI4WAL	81,950	300	50	200

NORWAY

LA8W	**2,926,378**	**3128**	**131**	**506**

POLAND

SQ6Z	**6,003,468**	**3842**	**158**	**646**
SNØKRT	347,574	717	70	248
SNØZDH	133,536	401	53	155
SP6KFA	132,795	461	45	150
SNØSON	121,170	441	46	164

PORTUGAL

CS1A	**1,330,410**	**2038**	**88**	**278**

SAN MARINO

T7ØA	**4,049,568**	**3926**	**133**	**521**

SCOTLAND

MMØAMV/P	**354,492**	**1041**	**55**	**203**
GM3USL/P	106,664	437	44	155

SICILY

IR9T	**6,070,740**	**3974**	**147**	**577**
IQ9A	1,156,785	1282	110	369

SLOVAK REPUBLIC

OM3A	**4,990,408**	**3830**	**154**	**558**
OM3KWZ	331,785	863	61	242

SLOVENIA

S5ØG	**4,807,044**	**3306**	**156**	**640**
S5ØS	**3,414,390**	**2992**	**146**	**564**

SPAIN

EA4ML	**5,380,245**	**3730**	**154**	**611**
EA5BY	**4,525,472**	**3535**	**138**	**485**
EA5URP	2,945,358	2600	119	414
EA1EEY	**2,562,768**	**2365**	**104**	**364**
ED3PX	**2,049,555**	**2054**	**109**	**308**
EA4RKU	1,801,980	2095	98	325
EA1COZ	1,187,823	1400	92	307
ED1BD	1,169,970	1535	85	269
EA1FEL	1,115,926	1301	94	319
EA4ST	1,028,534	1567	92	266
EA5YJ	938,320	1266	92	278
EA5FKX	933,852	1311	84	270
ED2WW	861,515	1211	80	244
EA3RKG	852,098	1297	92	246
ED1US	545,920	760	75	245
ED2RC	371,023	685	74	237
ED2BB	357,053	749	72	205
EA4TD	68,040	318	60	156

SWEDEN

SK6AW	**356,400**	**700**	**72**	**258**
SK6DG	295,928	772	63	221
SM4VPZ	228,179	624	51	208
SK7BQ	87,360	368	45	150

SWITZERLAND

HB5H	**4,040,296**	**3457**	**153**	**580**
HB5RL	1,767,150	2157	115	435
HB9AJM	177,120	902	84	285
HB5OK	73,602	577	24	117

UKRAINE

UR3IWA	**4,341,613**	**3233**	**151**	**542**
UT7Z	**4,047,472**	**4051**	**147**	**524**
UT3IZZ	603,632	800	99	307
UR4E	362,805	795	77	284
UT4UWC	194,000	572	59	191
UR4MWU	105,254	377	42	144

YUGOSLAVIA

YU1HFG	**432,432**	**888**	**85**	**279**
4N7Z	328,020	591	77	231

OCEANIA

EASTERN KIRIBATI

T32MP	**5,267,351**	**5284**	**126**	**235**

INDONESIA

YE5B	**1,078,048**	**1675**	**74**	**162**

MARSHALL ISLANDS

V73AX	**2,613,576**	**2499**	**130**	**246**

NEW CALEDONIA

TX8UA	**1,662,856**	**2196**	**88**	**183**

PHILIPPINES

DX1ØØDX	**1,273,038**	**1992**	**80**	**167**
DX1E	86,233	331	35	62

SOUTH AMERICA

ARGENTINA

LU1NF	**4,317,955**	**3653**	**126**	**359**
AY6D	2,273,290	3181	78	203
LU8XW	198,072	612	46	122

BRAZIL

PT2CM	**1,007,046**	**1615**	**86**	**220**
PY3UEB	58,370	241	45	85

CHILE

CE3F	**8,671,104**	**5825**	**145**	**431**

PARAGUAY

ZP9X	**2,065,140**	**2508**	**82**	**248**

TRINIDAD & TOBAGO

9Y4NW	**17,929,236**	**8614**	**156**	**585**

URUGUAY

CX1JK	301,300	826	35	96

VENEZUELA

YV4AA	**1,746,045**	**2618**	**88**	**257**

MULTI-OPERATOR MULTI-TRANSMITTER NORTH AMERICA

UNITED STATES

K3LR	**15,428,117**	**6652**	**192**	**761**
N2RM	**14,680,668**	**6238**	**180**	**734**
W3LPL	**13,990,992**	**5949**	**179**	**733**
W1FJ	**9,809,720**	**4638**	**167**	**657**
W2A	**9,391,460**	**4703**	**166**	**654**
K9NS	**8,498,458**	**4192**	**181**	**681**
W3PP	7,712,295	3958	163	632
W4MYA	**7,056,511**	**3690**	**168**	**623**
W2AX/1	6,805,500	3491	159	621
K1NU	6,738,936	3661	165	631
NQ4I	6,670,990	3981	167	606
W1GQ	6,584,178	3899	154	615

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K1RX	6,492,362	3324	164	633
N6AW	**6,308,100**	**3702**	**166**	**486**
KV1W	5,625,042	3085	152	581
K3II	4,944,000	2555	156	594
W7RM	**4,766,768**	**3320**	**162**	**442**
K3ANS	4,152,995	2313	163	574
N98ITU	**3,576,591**	**3625**	**161**	**516**
K2RD/1	3,521,259	2001	146	505
W3MM	2,797,508	1524	150	536
KB1H	2,725,056	1593	144	520
N2MM	2,619,540	1609	137	493
W8ZA	2,205,000	1502	137	463
W2XT	2,162,741	1422	135	472
AA1ON	2,139,375	1628	125	400
N5YV	2,087,372	1956	132	376
W1YK	1,885,845	1430	117	392
KF9YT	1,651,552	1371	125	386
AD1T	1,439,532	1176	112	374
W1QK	1,371,762	1080	113	400
K3DI	1,226,491	874	129	452
K6SG	1,141,975	1043	123	302
KD2KS	1,085,248	887	115	381
W1WFZ	695,460	689	99	303
KØUE	366,270	530	88	202
AF4EP	250,260	464	85	206
W6FSJ	158,782	362	75	122
N1KWJ	56,550	163	42	103

4U-UNITED NATIONS

4U1UN	**2,141,820**	**3323**	**84**	**242**

ANTIGUA

V26B	**30,539,106**	**15390**	**179**	**739**

CANADA

VE3EJ	**20,373,276**	**9613**	**183**	**741**
VY2SS	**16,331,830**	**8909**	**165**	**652**
VE6JY	**5,653,329**	**5829**	**129**	**360**
VE5RI	**2,139,456**	**3169**	**108**	**244**
VE3SY	894,288	1067	101	271

CUBA

CO2FRC	**728,726**	**1584**	**79**	**175**

GRENADA

J3A	**25,015,908**	**14132**	**171**	**652**

TURKS & CAICOS ISLANDS

VP5T	**12,930,489**	**9893**	**130**	**461**

AFRICA

AFRICAN ITALY

IH9P	**26,830,830**	**10878**	**175**	**715**

CEUTA & MELILLA

EA9EA	**32,346,460**	**12662**	**183**	**731**

ASIA

CHINA

B1A	**10,143,924**	**8739**	**159**	**454**

CYPRUS

P3A	**29,108,800**	**13073**	**182**	**738**

JAPAN

JA5BJC	**11,949,168**	**6394**	**171**	**561**
JA1YXP	**7,447,465**	**4504**	**168**	**485**
JA4EKO	**7,059,610**	**4136**	**171**	**514**
JA6ZPR	**4,152,384**	**2880**	**148**	**386**
JA1YPA	2,021,208	1926	132	292
JR7ZIT	182,025	408	75	150
JN1YUU	17,168	103	28	46

MACAO

XX9X	**10,890,408**	**8767**	**169**	**485**

MALDIVE ISLANDS

8Q7IO	**3,679,669**	**2981**	**126**	**421**

TAIWAN

BWØR	**1,987,270**	**3222**	**115**	**255**

THAILAND

E22AAA	**339,184**	**756**	**75**	**157**
E22AAD	105,938	469	63	98

EUROPE

BELGIUM

OT8A	**15,288,750**	**9898**	**167**	**739**

BULGARIA

LZ5Z	**3,982,471**	**3922**	**154**	**585**

CZECH REPUBLIC

OL7W	**1,041,084**	**1624**	**106**	**378**
OK1KIR	500,364	958	83	286

ENGLAND

M8T	**16,183,028**	**9315**	**174**	**803**

EUROPEAN RUSSIA

RN3D	**6,503,924**	**5585**	**170**	**656**

FINLAND

OH2HE	**10,157,670**	**6859**	**174**	**744**

FRANCE

TM2LEA	459,756	931	78	246

GERMANY

DLØCS	**7,914,186**	**5869**	**165**	**717**
DK5EZ	1,236,222	1192	117	470

HUNGARY

HG6Y	**10,154,965**	**7382**	**161**	**692**

ITALY

II2P	135,837	272	66	177

KALININGRAD

RW2F	**11,212,410**	**7861**	**179**	**736**

LIECHTENSTEIN

HBØ /HB9AON	**5,735,374**	**5768**	**116**	**498**

LITHUANIA

LY5A	**6,856,200**	**6210**	**163**	**617**
LY7A	**4,558,840**	**4957**	**146**	**569**

NETHERLANDS

PI4COM	**5,926,272**	**5023**	**150**	**586**

NORWAY

LA1K	**646,404**	**1736**	**68**	**286**

POLAND

SP5ZCC	**767,260**	**1186**	**97**	**357**

SPAIN

EA3CCN	**4,841,322**	**3966**	**138**	**504**
ED7VG	**1,849,404**	**2795**	**98**	**360**
ED4RAX	**691,775**	**1243**	**73**	**262**

SWEDEN

SK6NP	**796,272**	**1729**	**83**	**341**

YUGOSLAVIA

YZ7W	257,544	740	72	222

OCEANIA

BELAU

T88X	**11,387,229**	**8208**	**145**	**356**

GUAM

AH2R	**22,519,530**	**10643**	**184**	**590**

HAWAII

KH7R	**26,436,483**	**13468**	**185**	**524**

INDONESIA

YB3ZES	**476,740**	**931**	**64**	**156**

NEW ZEALAND

ZM2K	**8,535,360**	**6284**	**132**	**378**

PHILIPPINES

DX1DBT	**1,050,008**	**1704**	**80**	**161**
DX3T	160,644	320	38	94

SOUTH AMERICA

ARGENTINA

LU4FM	**11,039,024**	**8117**	**152**	**440**

BRAZIL

PY3MHZ	**648,536**	**990**	**81**	**178**

NETHERLANDS ANTILLES

PJ9B	**53,994,248**	**19323**	**189**	**823**

CHECK LOGS

Our thanks to the following stations who sent in check logs:

3A2MG, 4Z5GV, 9G5BQ, CT2GVG, DF2KK, DJ3VC, DL1ARD, DL1ARK, DL1DWT, DL1HSR, DL1JMS, DL2RTL, DL3NEO, DL5NA, DL6MDG, DL8KWA, EA1BID, EA1CZF, EA1EBJ, EA1FAE, EA2BAP, EA3ALD, EA3ALV, EA3BJM, EA3CIS, EA3FLR, EA4AFI, EA4CEN, EA4EER, EA4FW, EA5AOM, EA5AQP, EA5JC, EA5SM, EA8AOD, EA8BRW, EA8IK, EC7AMQ, ER1IM, EW3LB, EW8DA, F6CXJ, KØMLH, K3SWZ, K6FM, KCØDAX, KC5YEE, KX7J, LA1FW, LA2XIA, LA4OGA, LA4XFA, LA5YV, LA7FJA, LA9LO, LA9NM, LU5IBL, LW7EGO, LY3GJ, LZ2SX, LZ4UU, OH3TY, OH6ZH, OK1ARI, OK1IWI, OK2KOS, OK2KRT, OK2XA, OM3EA, PAØFV, PAØUKC, PAØUV, PA3EXI, PT2TF, PU2VJJ, PU2YCR, PY2DBU, PY2DUN, PY5IP, RAØJCY, RA4CEW, RN3AM, RW9SG, RX9FB, RZ1AR, SMØBFJ, SMØBXT, SMØLZT, SM5CVC, SM6BSK, SP1GZT, SP2DWA, SP2HMT, SP2MEF, SP2SCX/9, SP3BLT, SP3SLD, SP3VAU, SP3WBQ, SP4TKR, SP4X, SP5CEQ, SP5EWX, SP5OXJ, SP5SSB, SP5YIQ (Opr. SP5DIQ), SP6CES, SP6CYX, SP6IEQ, SP6NVK, SP6YGB/9 (Opr. SQ9CAQ), SP7GAQ, SP8EEX, SP8FHM, SP8OOB, SP8WJD, SP8WJO, SP9AVZ, SP9CCA, SP9MQH, SP9OYT, SQ8AMD, UAØJD, UAØUAG, UA1AQF, UA3AGS, UA3DEA, UA9CES, UA9XK, UN9PQ, UR5FF, UR5UAC, UT5UOC, VE7PXE/W8, VU2FOT, W7CAV/3, W8TOP, WB4HUX, YO2BEH, YO2KJW, YO8AII, YO8ATT, YO9BGV.

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Washington Readout

BY FREDERICK O. MAIA, W5YI

Regulatory News In The World Of Amateur Radio

Amateur Service Switches to Universal Licensing System

The illustrious FCC Form 610 amateur radio application form is about to fade into ham radio history—that is, if everything goes according to schedule. By the time you read this, the decades old FCC Form 610 will have been replaced by a new FCC Form 605 and its accompanying Schedule "D." In addition, new information collection requirements are being mandated by the FCC. For the first time, applicants for new, upgraded, or renewed amateur radio operator/ station licenses will be asked to provide their Social Security Number to the FCC.

Except for the fact that the FCC Order (released October 21, 1998) implementing the new Universal Licensing System (ULS) permits the VECs to design their own information collection forms, an applicant could have faced three different forms when he/she took a license examination instead of one. The possible three forms needed for examining amateur radio operator applicants are the:

1. **FCC Form 605** *("Quick Form Application in the Ship, Aircraft, Amateur, Restricted and Commercial Operator, and General Mobile Radio Services").* This form can be kind of confusing, since it also is used to collect information needed for radio services other than the Amateur Radio Service.

2. **Schedule D** *(Additional Data in the Amateur Radio Service).* This form, which must be included along with the FCC Form 605, is used to request a "systematic" station callsign change or a "vanity" callsign. The reverse side of the form is used to obtain a Physician's Certification of a disability which grants applicants an exemption from having to pass the 13 and 20 wpm Morse code examinations.

3. **VE Worksheet** (needed by the VEC System to indicate examinations passed, VE certifications, exam site and date, etc.). The FCC did not provide any forms to be used in connection with amateur license examinations. There is not even a place on the FCC Form 605 or its accompanying Schedule "D" for the applicant's license class, which is a required item in the Amateur Service database.

National Volunteer Examiner Coordinator, P.O. Box 565101, Dallas, TX 75356-5101 (telephone 817-461-6443 e-mail: <fmaia@cwixmail.com>)

Fortunately, the ULS *Order* authorizes the VEC System to prepare their own information collection forms. This authorization is embodied in the new Part 1.913(f) Rules which state:

"(f) *Applications for amateur licenses.* Each candidate for an amateur radio operator license which requires the applicant to pass one or more examination elements must present the administering Volunteer Examiners (VE) with all information required by the rules prior to the examination. The VEs may collect the information required by these rules in any manner of their choosing, including creating their own forms. . . . ."

The VECs have now agreed to use an internally created single-sheet form they call the "NCVEC Form 605." It contains all the information needed to be collected by the new ULS and VEC System. It was designed to be very similar to the current FCC Form 610 to minimize confusion caused by the transition from the Form 610 to the Form 605. The VECs were also advised that the old FCC Form 610 could continue to be used during a six-month transition period as long as the candidate's Social Security Number (SSN) or the "Licensee ID" was included.

The "Licensee ID" is a number which corresponds to the applicant's SSN. It is generated as part of an applicant's registration of his/her SSN with the Commission. Examinees who do not wish to provide their SSN to the VEC System *must* register their SSNs to obtain the "Licensee ID." Effective August 2, 1999, all Amateur Service applications must contain the new collection information.

The "NCVEC Form 605" is to be used by VEs and VECs (only) when they participate in functions authorized by the ULS Order. That includes the batch filing of new, upgraded, and renewed licenses, or the application or renewal of club, military recreation, or RACES station licenses. The FCC is in the process of establishing "Club Coordinators" who will handle the club and military recreation station applications and renewals and the renewal of RACES stations. (The FCC will no longer accept applications for new RACES stations.)

The "NCVEC Form 605" *must* be presented to a VE or forwarded to a VEC for handling. It *cannot* be forwarded directly to the FCC. The FCC will still accept the manual filing of paper documents, but you must use their version of the Form 605 and the Schedule "D."

Why Does The FCC Need Your SSN?

The FCC is required by the Debt Collection Improvement Act of 1996 to collect Social Security Numbers or Taxpayer Identification Numbers (TINs) when they issue a license. Taxpayer Identification Numbers are issued to employers, and since all amateur radio operators are individuals, it is the SSN that must be furnished to the FCC. However, it is still referred to as a TIN.

Furnishing the TIN to the FCC can be accomplished in either of two ways:

1. You can furnish the VE team or VEC with your SSN, or if you prefer not to,

2. You can register your SSN with the FCC using a procedure that we outlined in our July *CQ* column.

Some amateurs are stubborn in opposing the requirement that they furnish their SSN to the FCC. However, this is not open to further discussion among the amateur community, or the FCC for that matter. Congress required the SSN/TIN collection procedure on all Federal agencies in April 1996. The FCC is just following through on what is now *Public Law 104-134.*

At press time, a procedure was still being developed by the FCC to provide a special "Assigned Licensee ID" for use by foreign amateur radio applicants who do not have, and are not eligible to obtain, an SSN. The Part 97 rules specifically provide for the FCC licensing of non-citizens.

The bottom line is that you will either have to furnish the VE team (or VEC) with your SSN—or a corresponding "Licensee ID" number that is generated when you register your SSN with the FCC—or you will be unable to obtain a new or upgraded license, nor will you be able to renew an existing license.

There has been considerable controversy within the amateur community about the legality of U.S. Government agencies requiring the submission of an SSN in order to obtain an amateur radio license. Section 7(a)(1) of the Privacy Act of 1974 (Public Law 93-579, December 31, 1974) provides: "That it shall be unlawful for any Federal, State, or local government agency to deny to any individual any right, benefit, or privilege provided by

law because of such individual's refusal to disclose his social security account number." However, the next section (Sec. 7(a)(2) adds " . . . the provisions of paragraph (1) of this subsection shall not apply with respect to—(A) any disclosure which is required by Federal statute." Congress later passed the Debt Collection Improvement Act of 1996 and it was signed into law as Public Law 104-134.

The primary purpose of the Debt Collection Improvement Act of 1996 is to maximize collections of delinquent debts owed to the government at minimum cost. This measure marks the beginning of federal efforts to collect delinquent debts which now total over $100 billion.

A key part of the law is access to Taxpayer Identification Numbers, which are needed to facilitate the collection of delinquent debts. All federal agencies are now required to collect and send the SSN/TIN information to the Dept. of the Treasury, where it will be used to identify entities that owe the government money.

Public Law 104-134 also permits federal agencies to contract with private collection firms to locate and recover assets and to pay for such services out of the proceeds that are recovered, or to pay "finders fees" to persons who locate and recover assets of the United States the existence of, or location of, which is unknown to the Federal Government. All outstanding payments paid to the treasury must include the SSN or TIN. Here is the relevant part of the Act *(emphasis added):*

From: PUBLIC LAW 104-134:

(I)(1) IN GENERAL. Section 7701 of title 31, United States Code, is amended by adding at the end the following new sub-sections

(c)(1) The head of each Federal agency shall *require each person doing business with that agency to furnish to that agency such person-'s taxpayer identifying number.*

(3) For purposes of this subsection, *a person shall be considered to be doing business with a Federal agency if the person is:*

(1) a lender or servicer in a Federal guaranteed or insured loan program administered by the agency;

(B) *an applicant for, or recipient of, a Federal license, permit, right-of-way, grant, or benefit payment administered by the agency or insurance administered by the agency;*

(C) a contractor of the agency;

(4) *assessed a fine,* fee, royalty or penalty by the agency; and

(E) *in a relationship with the agency that may give rise to a receivable due to that agency,* such as a partner of a borrower in or a guarantor of a Federal direct or insured loan administered by the agency.

(3) Each agency shall disclose to a person required to furnish a taxpayer identifying number under this subsection its intent to use such number for purposes of collecting and reporting on any delinquent amounts arising out of such person's relationship with the Government.

Many other radio services have already been converted into the ULS. The FCC plans to begin implementing the Amateur Service portion of the Universal Licensing System on August 2nd. The ULS rules require all new and upgraded amateur license information to be electronically filed with the Commission. One of the required items that VECs *must* electronically transmit to the FCC is the Social Security Number or the "Licensee ID."

This information *must* be contained in "Field position 4" of the "Amateur Applicant Information" record or the application will be automatically rejected (dismissed) by the FCC computer.

Registering Your Social Security Number

Again, here is the registration procedure that applicants for Amateur Radio Operator/Station licenses must follow *if they do not wish to give their SSN to the VE/VEC or to the FCC on an application form.*

1. Once the existing Amateur Service database is converted to the Universal Licensing System (ULS), it will be necessary that all applications submitted contain either the applicant's Social Security Number or its corresponding "Licensee ID." You obtain the "Licensee ID" by registering your SSN with the FCC.

2. Registration is the process of identifying yourself (and your callsigns if you have one or more) to the ULS. By placing this information in the ULS, it can automatically be retrieved each time you file an application with the Commission. You do not need to hold an FCC license in order to register with the ULS. *First-time applicants for an amateur radio license must also register prior to filing an application if they do not wish to furnish their SSN to the VE/VEC System.* Once registered, your Social Security Number will not be disclosed.

3. Registration permits amateurs to file applications electronically (i.e., requests for Vanity callsigns, renewal applications) and to perform "administrative updates" such as address, phone number, e-mail address, name changes, etc.

4. You will receive a nine-character Licensee Identification Number when you register. This number will begin with the letter "L" and be followed by eight digits. If you are registered in ULS, you will not need to provide your Social Security Number to the VE/VEC. Instead, you furnish your Licensee Identification Number.

5. When registering, you provide your Social Security Number, as well as your name, mailing address, phone number, and any callsign for which you are licensed, regardless of radio service (for example, if you have an Amateur Service license and a license in one of the Private Land Mobile Radio Services, you need to provide the callsign for *both* licenses).

6. In the current Amateur Service database, your station callsign is used as the "key," or "unique identifier." ULS uses your Social Security Number (and *not* your station callsign) as the record identifier.

7. An applicant can register for the ULS either:

a. electronically over the Internet by pointing your web browser to <http://www.fcc.gov/wtb/uls> and clicking on the "TIN/Call Sign Registration button." or

b. you can file a paper FCC Form 606 document. This form may be obtained by either downloading it from the web at <http://www.fcc.gov/formpage.html> or from the FCC's Forms Distribution Center at telephone number 1-800-418-FORM (3676). The completed form should either be faxed to 717-338-2693 or mailed back to Federal Communications Commission, Information Technology Division, Attention: Kathy McLucas, 1270 Fairfield Road, Gettysburg, PA 17325-7245.

73, Fred, W5YI

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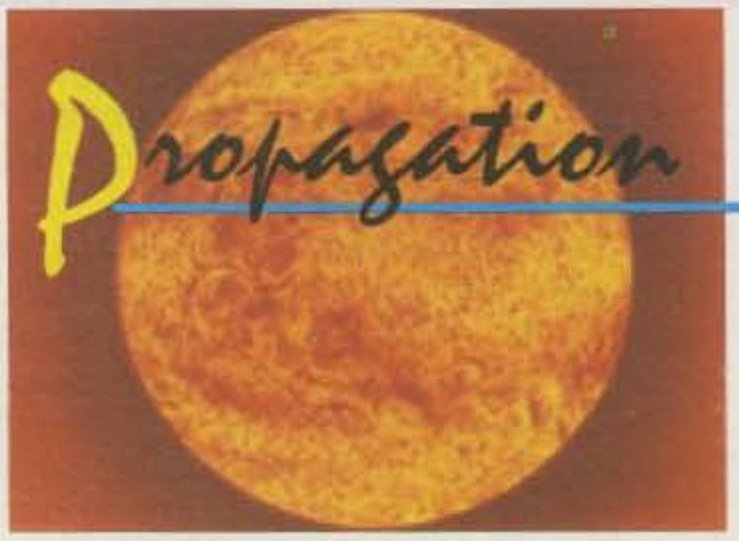

BY GEORGE JACOBS, W3ASK

The Science Of Predicting Radio Conditions

Sunspots Begin to Heat Up

LAST-MINUTE FORECAST

Day-to-Day Conditions Expected for September 1999

Propagation Index	Expected Signal Quality (4)	(3)	(2)	(1)
Above Normal: 2, 8, 11, 18 28-29	A	A	B	C
High Normal: 1, 5-7, 9-10, 25-26	A	B	C	C-D
Low Normal: 4, 12-13, 17, 19 22-23, 27	B	C-B	C-D	D-E
Below Normal: 3, 14, 16, 21 24, 30	C	C-D	D-E	E
Disturbed: 15, 20	C-D	D	E	E

Where expected signal quality is:

A—Excellent opening, exceptionally strong, steady signals greater than S9.

B—Good opening, moderately strong signals varying between S6 and S9+, with little fading or noise.

C—Fair opening, signals between moderately strong and weak, varying between S3 and S9, with some fading and noise.

D—Poor opening, with weak signals varying between S1 and S6, with considerable fading and noise.

E—No opening expected.

HOW TO USE THIS FORECAST

1. Find the *propagation index* associated with the particular path opening from the Propagation Charts appearing on the following pages.

2. With the *propagation index*, use the above table to find the expected signal quality associated with the path opening for any given day of the month. For example, an opening shown in the Propagation Charts with a *propagation index* of 3 will be good (B) on Sept. 1st, excellent (A) on the 2nd, fair-to-poor (C-D) on the 3rd, fair (C) on the 4th, good (B) on the 5th through 7th, etc.

In the 36th month of sunspot Cycle 23, it has finally begun to act as would be expected during a period of increasing sunspot activity.

The Royal Observatory of Belgium reports a mean sunspot number of 106 for May 1999. This is the highest monthly mean observed to date for Cycle 23.

The daily sunspot count reached a high of 151 on May 8th. This is the highest daily count to date in Cycle 23. A monthly low of 75 was reported for May 1st.

The mean value for May results in a 12-month running smoothed sunspot number of 73 centered on November 1998. This is an increase of two from last month's smoothed number. The smoothed sunspot number is a 12-month average of monthly mean values centered on the middle month. The sunspot cycle is measured by its smoothed monthly numbers. A smoothed sunspot count in the lower 100s is forecast for September 1999.

A corresponding increase was reported in the 10.7 cm solar flux level. Canada's Dominion Radio Astrophysical Observatory in Penticton, B.C. reports a monthly mean of 151 for May 1999. This results in a smoothed value of 132 centered on November 1998. A smoothed level in the mid 150s is forecast for September 1999.

From preliminary data it appears that the sunspots were even hotter during June, with counts exceeding 300 on several days. We will have more about this in next month's column.

11307 Clara Street, Silver Spring, MD 20902
e-mail: <george@gjainc.com>

The Salted Ionosphere Galileo Galilei

Last year we "salted the ionosphere" at the Royal Observatory of Belgium, where Dr. Paul Cugnon is the world's official keeper of sunspot data. While there is no scientific explanation for it, Mother Nature again provided favorable ionospheric conditions during the 1998 CQ WW DX Contest periods, as she has done for nearly a decade, during which we have mythically salted the ionosphere at some significant world location.

This year we decided to go back into history, and we carried our mythical bag of salt to Padua, in northeastern Italy. Padua (or Padova, in Italian) is located on the Bacchiglione River, 22 miles west of Venice. It is a noted educational, art, trading, and manufacturing center, but it is most famous for its university. The university of Padua is one of the oldest in Europe, having been established in the 13th century. The university is most famous for Galileo Galilei, who is generally known only by his first name. Among his many other very valuable contributions to science, Galileo was the first to view sunspots telescopically.

In 1592 Galileo, already a well-known scientist, was offered a professorship at the University of Padua. In about 1609, after word from Holland of a newly invented telescope reached him, Galileo built his own version of a more powerful telescope, with which he viewed the heavens. He was the first to see the mountains and craters on the Moon and the four satellites of Jupiter, and he found the Milky Way to be a dense collection of stars.

Although ancient archives report visual sightings of sunspots, Galileo was the first to observe them on a regular basis telescopically. Many of his original drawings of sunspots made from his telescopic viewing can be seen at the University of Padua. Galileo theorized that the drifting of sunspots and their rotation in about 27 days was due to the rotation of the solar globe. These and other observations led him to support the Copernican theory that the Sun is the center of the universe, and that the Earth and other planets rotate in their own separate orbits and in orbits around the sun.

The response of the Church to this new idea was a warning to Galileo that the theory was contrary to Church doctrine. Galileo was called before the Inquisition in Rome and forced to recant his statements. He remained under house arrest until his death in 1642. In 1984, 342 years later, Galileo was pardoned by Pope John Paul II.

With such an historic relationship between sunspots, Galileo, and the University of Padua, we chose Padua as an appropriate location for this year's pilgrimage. On a warm, sunny day in late May we "salted the ionosphere" directly above the monument erected at the university in 1992 to commemorate the 400th anniversary of Galileo's professorship. This mythical tribute hopefully will influence Mother Nature to again cast her brilliance for a strong ionosphere during the 1999 CQ WW DX Contest.

CQ WW DX Contest Special '99

The 1999 contest weekends will mark the 49th consecutive CQ WW DX Contest for which this column has contained special propagation forecasts and information. This year's contest weekends are:

October 30–31: SSB section
November 27–28: CW section

In the tradition of the past 48 years, next month's column will be devoted to a special, comprehensive forecast focusing on both sections of the 1999 contest. Besides worldwide propagation predictions, the column will also contain pointers for scoring as many points as possible, as well as

Visit Our Web Site

tips and URL addresses for making the most of the very valuable information on the Internet.

September Conditions

During September a greater number of DX openings are expected on 10, 12, 15, 17, and 20 meters during the hours of daylight. Improved nighttime DX propagation conditions are also forecast for the 30, 40, 80, and 160 meter bands, with considerably lower static levels. A seasonal decline in conditions is expected on 20 meters during the hours of darkness, but this is expected to remain a good band for DX almost around the clock.

The fall, or autumnal, equinox will occur on September 22nd as the Sun crosses the plane of the equator on its apparent travel from northern to southern skies. On this day the hours of daylight and darkness are equal in length throughout the world. The effects of the equinox are felt on HF propagation conditions from about mid-September through early October. During this period the characteristics of the ionosphere are similar over large areas of the world, and this is usually the best season for DX openings between the temperate regions of both the northern and southern hemispheres.

A similar period occurs during the spring equinox, which is centered on March 21st. Look for an improvement in conditions between the USA and South America, to the South Pacific area and Australasia, to southern Asia, and to southern Africa and Antarctica. This improvement should be noticeable on all bands 10 through 160 meters. The best time for equinoctial-type openings should be the twilight periods around local sunrise and sunset, but they will occur at other times as well. Many of these inter-hemispheric openings may follow either the long or the short great circle path, so be sure to check both directions.

For short-skip propagation during September and October, use 80 meters during the day for openings shorter than 250 miles, and either 80 or 160 meters at night over this range. For openings between 250 and 750 miles, try 30 and 40 meters during the day and 80 meters at night. For distances between 750 and 1300 miles, the best bet should be 20 meters by day, 30 and 40 meters from sundown to midnight, and 80 meters from midnight to sunrise. For openings beyond 1300 miles, try 15, 17, or 20 meters during the day and 30 and 40 meters during the hours of darkness. Check 10 and 12 meters for some fairly good openings beyond 1300 miles during the afternoon hours, particularly when conditions are High Normal or better.

September is a month of change for propagation conditions on the HF amateur bands. On some days conditions will seem to be much the same as during the summer months, while on other days the first signs of wintertime conditions will be noticeable. For this reason, this month's column contains both Short-Skip and DX Propagation Charts. The DX Charts are valid for the period from mid-September through mid-October, and the Short-Skip Charts are valid for the entire months of September and October.

VHF Ionospheric Openings

Solar activity is now high enough to support *F-2* layer DX openings from the U.S.

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HOW TO USE THE DX PROPAGATION CHARTS

1. Use chart appropriate to your transmitter location. The Eastern USA Chart can be used in the 1, 2, 3, 4, 8, KP4, KG4, and KV4 areas in the USA and adjacent call areas in Canada; the Central USA Chart in the 5, 9, and 0 areas; the Western USA Chart in the 6 and 7 areas; and with somewhat less accuracy in the KH6 and KL7 areas.

2. The predicted times of openings are found under the appropriate meter band column (10 through 80 meters) for a particular DX region, as shown in the left-hand column of the charts. An * indicates the best time to listen for 160 meter openings.

3. The propagation index is the number that appears in ( ) after the time of each predicted opening. The index indicates the number of days during the month on which the opening is expected to take place as follows:

(4) Opening should occur on more than 22 days
(3) Opening should occur between 14 and 22 days
(2) Opening should occur between 7 and 13 days
(1) Opening should occur on less than 7 days

Refer to the "Last Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

4. Times shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 A.M.; 13 is 1 P.M., etc. Appropriate *daylight* time is used, not GMT. To convert to GMT, add to the times shown in the appropriate chart 7 hours in PDT Zone, 6 hours in MDT Zone, 5 hours in CDT Zone, and 4 hours in EDT Zone. For example, 14 hours in Washington, D.C. is 18 GMT. When it is 20 hours in Los Angeles, it is 03 GMT, etc.

5. The charts are based upon a transmitted power of 250 watts CW, or 1 kw, PEP on sideband, into a dipole antenna a quarter-wavelength above ground on 160 and 80 meters, and a half-wavelength above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the *propagation index* will increase by one level; for each 10 dB loss, it will lower by one level.

6. Propagation data contained in the charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept of Commerce, Boulder, Colorado 80302.

September 15 - October 15, 1999
Time Zone: EDT (24-Hour Time)
EASTERN USA TO:

	10 Meters	*15 Meters*	*20 Meters*	*40/80 Meters*
Western & Central Europe & North Africa	08-10 (1) 10-11 (2) 11-13 (3) 13-15 (2) 15-16 (1)	08-09 (1) 09-11 (2) 11-14 (4) 14-15 (3) 15-17 (2) 17-19 (1)	02-04 (1) 04-06 (2) 06-10 (3) 10-12 (2) 12-15 (3) 15-17 (4) 17-21 (3) 21-02 (2)	18-19 (1) 19-21 (2) 21-23 (3) 23-02 (4) 02-03 (3) 03-04 (2) 04-05 (1) 20-22 (1)* 22-01 (2)* 01-04 (1)*
Northern Europe & European CIS	09-10 (1) 10-13 (2) 13-14 (1)	08-09 (1) 09-10 (2) 10-13 (3) 13-14 (2) 14-16 (1)	03-06 (1) 06-08 (2) 08-11 (3) 11-13 (2) 13-17 (3) 17-19 (2) 19-21 (1)	18-20 (1) 20-04 (2) 04-06 (1) 21-04 (1)*
Eastern Mediter-ranean & Middle East	09-10 (1) 10-12 (2) 12-14 (1)	08-09 (1) 09-12 (2) 12-14 (3) 14-16 (2) 16-18 (1)	07-09 (2) 09-15 (1) 15-17 (2) 17-21 (3) 21-23 (2) 23-01 (3) 01-03 (2) 03-07 (1)	19-21 (1) 21-00 (2) 00-01 (1) 22-00 (1)*
Western Africa	09-12 (1) 12-14 (2) 14-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	07-09 (1) 09-13 (2) 13-15 (3) 15-17 (4) 17-19 (3) 19-20 (2) 20-22 (1)	05-08 (2) 08-15 (1) 15-17 (2) 17-21 (4) 21-00 (3) 00-03 (2) 03-05 (1)	20-23 (1) 23-02 (2) 02-04 (1) 00-03 (1)*
Eastern & Central Africa	10-12 (1) 12-14 (2) 14-16 (3) 16-17 (2) 17-18 (1)	08-10 (1) 10-13 (2) 13-14 (3) 14-16 (4) 16-18 (3) 18-19 (2) 19-20 (1)	12-14 (1) 14-17 (2) 17-22 (3) 22-02 (2) 02-03 (1)	20-02 (1) 00-01 (1)*
Southern Africa	09-11 (1) 11-12 (2) 12-13 (3) 13-14 (2) 14-15 (1)	08-11 (1) 11-12 (2) 12-13 (3) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	06-08 (2) 08-15 (1) 15-16 (2) 16-19 (3) 19-00 (2) 00-03 (3) 03-04 (2) 04-06 (1)	19-22 (1) 22-00 (2) 00-02 (1) 23-01 (1)*
Central & South Asia	09-11 (1) 19-22 (1)	08-09 (1) 09-12 (2) 12-13 (1) 20-22 (1)	07-08 (1) 08-10 (2) 10-12 (1) 17-19 (1) 19-22 (2) 22-01 (1)	05-07 (1) 20-23 (1)
Southeast Asia	11-14 (1) 18-21 (1)	08-09 (1) 09-11 (2) 11-13 (1) 13-15 (2) 15-19 (1) 19-21 (2) 21-22 (1)	06-07 (1) 07-10 (2) 10-12 (1) 15-18 (1) 20-21 (1) 21-00 (2) 00-02 (1)	06-08 (1)
Far East	09-11 (1) 18-20 (1)	08-09 (1) 09-11 (2) 11-13 (1) 16-18 (1) 18-20 (2) 20-22 (1)	07-08 (1) 08-10 (3) 10-12 (2) 12-14 (1) 18-20 (1) 20-22 (2) 22-00 (1) 00-03 (2) 03-04 (1)	05-08 (1) 18-19 (1) 05-07 (1)*
South Pacific & New Zealand	09-14 (1) 14-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-22 (1)	08-09 (1) 09-11 (2) 11-14 (1) 14-17 (2) 17-18 (3) 18-20 (4) 20-21 (3) 21-22 (2) 22-00 (1)	12-20 (1) 20-22 (2) 22-00 (3) 00-02 (4) 02-04 (3) 04-08 (2) 08-10 (3) 10-12 (2)	01-02 (1) 02-03 (2) 03-06 (3) 06-08 (2) 08-09 (1) 03-05 (1)* 05-07 (2)* 07-08 (1)*
Australasia	10-12 (1) 14-16 (2) 17-18 (3) 18-19 (2) 19-21 (1)	08-09 (1) 09-10 (2) 10-12 (3) 12-14 (2) 14-17 (1) 17-18 (2) 18-20 (4) 20-21 (2) 21-23 (1)	07-09 (2) 09-11 (3) 11-13 (2) 13-16 (1) 16-18 (2) 18-21 (1) 21-23 (2) 23-02 (3) 02-04 (2) 04-07 (1)	02-04 (1) 04-06 (2) 06-07 (3) 07-08 (2) 08-09 (1) 04-05 (1)* 05-06 (2)* 06-07 (1)*
Caribbean, Central America & Northern Countries of South America	08-09 (1) 09-10 (2) 10-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	06-07 (1) 07-08 (2) 08-11 (4) 11-13 (3) 13-18 (4) 18-20 (3) 20-21 (2) 21-22 (1)	03-05 (2) 05-07 (3) 07-10 (4) 10-14 (2) 14-16 (3) 16-23 (4) 23-03 (3)	19-20 (1) 20-21 (2) 21-04 (4) 04-06 (3) 06-07 (2) 07-08 (1) 21-23 (1)* 23-04 (2)* 04-06 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	08-09 (1) 09-13 (2) 13-15 (3) 15-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	06-07 (1) 07-08 (2) 08-11 (3) 11-15 (2) 15-16 (3) 16-19 (4) 19-21 (3) 21-22 (2) 22-23 (1)	10-16 (1) 16-17 (2) 17-18 (3) 18-00 (4) 00-03 (3) 03-05 (2) 05-07 (3) 07-10 (2)	21-00 (1) 00-04 (2) 04-06 (1) 01-05 (1)*
McMurdo Sound, Antarctica	15-19 (1)	11-15 (1) 15-17 (2) 17-21 (3) 21-22 (2) 22-23 (1)	16-17 (1) 17-20 (2) 20-03 (3) 03-05 (2) 05-07 (1) 07-09 (2) 09-10 (1)	23-01 (1) 01-05 (2) 05-07 (1) 04-06 (1)*

Time Zones: CDT & MDT
(24-Hour Time)
CENTRAL USA TO:

	10 Meters	*15 Meters*	*20 Meters*	*40/80 Meters*
Western & Southern Europe & North Africa	09-11 (1) 11-13 (2) 13-14 (1)	08-10 (1) 10-12 (2) 12-14 (3) 14-16 (2) 16-17 (1)	06-07 (1) 07-10 (2) 10-13 (1) 13-14 (2) 14-16 (4) 16-18 (3) 18-23 (2) 23-03 (1)	18-20 (1) 20-23 (2) 23-01 (3) 01-02 (2) 02-03 (1) 21-23 (1)* 23-01 (2)* 01-02 (1)*
Northern & Central Europe & European CIS	09-13 (1)	08-09 (1) 09-11 (2) 11-12 (3) 12-13 (2) 13-15 (1)	06-07 (1) 07-10 (2) 10-12 (1) 12-13 (2) 13-17 (3) 17-19 (2) 19-21 (1)	20-23 (1) 23-01 (2) 01-02 (1) 22-01 (1)
Eastern Mediter-ranean & Middle East	10-13 (1)	08-09 (1) 09-11 (2) 11-13 (3) 13-14 (2) 14-16 (1)	06-07 (1) 07-09 (2) 09-14 (1) 14-16 (2) 16-20 (3) 20-22 (2) 22-00 (3) 00-01 (2) 01-02 (1)	20-23 (1) 21-23 (1)*
Western Africa	10-12 (1) 12-14 (2) 14-16 (3) 16-17 (2) 17-18 (1)	07-10 (1) 10-13 (2) 13-15 (3) 15-17 (4) 17-18 (3) 18-20 (2) 20-21 (1)	05-08 (2) 08-15 (1) 15-17 (2) 17-19 (3) 21-23 (3) 23-02 (2) 02-05 (1)	20-23 (1) 23-01 (2) 01-02 (1) 23-01 (1)*
Eastern & Central Africa	11-13 (1) 13-16 (2) 16-17 (1)	09-10 (1) 10-13 (2) 13-17 (3) 17-18 (2) 18-19 (1)	13-15 (1) 15-17 (2) 17-20 (3) 20-23 (2) 23-00 (1) 07-09 (1)	21-00 (1)
Southern Africa	09-11 (1) 11-12 (2) 12-13 (3) 13-14 (2) 13-15 (1)	07-09 (1) 09-12 (2) 12-13 (3) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	06-08 (2) 08-14 (1) 14-16 (2) 16-19 (3) 19-22 (2) 22-01 (3) 01-05 (1)	20-21 (1) 21-23 (2) 23-01 (1) 21-23 (1)*
Central & South Asia	09-11 (1) 19-21 (1)	09-11 (1) 18-19 (1) 19-21 (2) 21-22 (1)	07-08 (1) 08-10 (2) 10-12 (1) 17-19 (1) 19-22 (2) 22-01 (1)	06-08 (1) 19-21 (1)
Southeast Asia	10-12 (1) 12-13 (2) 13-15 (1) 17-18 (1) 18-19 (2) 19-20 (1)	09-11 (1) 11-13 (2) 13-15 (1) 18-19 (1) 19-20 (2) 20-22 (1)	07-08 (1) 08-09 (2) 09-10 (3) 10-11 (2) 11-13 (1) 16-20 (1) 20-23 (2) 23-02 (1)	05-09 (1)
Far East	15-17 (1) 17-19 (2) 19-20 (1)	10-16 (1) 16-18 (2) 18-21 (3) 21-22 (2) 22-23 (1)	07-08 (1) 08-10 (3) 10-12 (2) 12-16 (1) 16-19 (2) 19-21 (1) 21-23 (2) 23-00 (3) 00-01 (2) 01-03 (1)	03-05 (1) 05-08 (2) 08-09 (1) 06-08 (1)
South Pacific & New Zealand	11-13 (1) 13-14 (2) 14-15 (3) 15-18 (4) 18-19 (3) 19-20 (2) 20-22 (1)	08-09 (1) 09-15 (2) 15-17 (3) 17-20 (4) 20-21 (3) 21-22 (2) 22-00 (1)	04-08 (2) 08-11 (3) 11-13 (2) 13-18 (1) 18-20 (2) 20-22 (3) 22-02 (4) 02-04 (3)	00-01 (1) 01-06 (3) 06-08 (4) 08-09 (2) 09-10 (1) 02-04 (1)* 04-07 (2)* 07-08 (1)*
Australasia	09-13 (1) 13-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-22 (1)	08-09 (1) 09-11 (2) 11-15 (1) 15-16 (2) 16-18 (3) 18-20 (4) 20-21 (3) 21-22 (2) 22-23 (1)	06-08 (2) 08-11 (3) 11-13 (2) 13-16 (1) 16-18 (2) 18-20 (1) 20-22 (2) 22-00 (3) 00-02 (4) 02-04 (3)	02-03 (1) 01-06 (3) 05-07 (3) 07-08 (2) 08-09 (1) 05-06 (1)* 06-07 (2)* 07-08 (1)*
Caribbean, Central America & Northern Countries of South America	08-09 (1) 09-10 (2) 10-12 (3) 12-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	07-08 (1) 08-09 (2) 09-11 (4) 11-14 (3) 14-18 (4) 18-19 (3) 19-20 (2) 20-21 (1)	07-10 (4) 10-12 (3) 12-14 (2) 14-16 (3) 16-23 (4) 23-03 (3) 03-05 (2) 05-07 (3)	19-20 (1) 20-21 (2) 21-22 (3) 22-05 (4) 05-06 (3) 06-07 (2) 07-08 (1) 20-23 (1)* 23-05 (2)* 05-07 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile,	08-09 (1) 09-12 (2) 12-14 (1) 14-15 (2) 15-16 (3)	07-08 (1) 08-09 (2) 09-11 (3) 11-15 (2) 15-16 (3)	11-16 (1) 16-17 (2) 17-20 (3) 20-01 (4) 01-04 (3)	21-00 (1) 00-05 (2) 05-07 (1) 01-06 (1)*

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Argentina, & Uruguay	16-18 (4) 18-19 (2) 19-20 (1)	16-20 (4) 20-22 (3) 22-23 (2) 23-00 (1)	04-06 (2) 06-08 (3) 08-11 (2)	
McMurdo Sound, Antarctica	16-19 (1)	12-15 (1) 15-18 (2) 18-21 (3) 21-22 (2) 22-23 (1)	16-18 (1) 18-22 (2) 22-01 (3) 01-04 (2) 04-08 (1) 08-10 (2) 10-11 (1)	23-01 (1) 01-05 (2) 05-07 (1) 05-07 (1)*

Time Zone: PDT (24-Hour Time)
WESTERN USA TO:

	10 Meters	*15 Meters*	*20 Meters*	*40/80 Meters*
Western & Southern Europe & North Africa	09-12 (1)	08-09 (1) 09-10 (2) 10-12 (3) 12-13 (2) 13-15 (1) 22-00 (1)	06-07 (1) 07-10 (2) 10-12 (1) 12-14 (2) 14-17 (3) 17-19 (2) 19-21 (1) 23-01 (1)	20-21 (1) 21-23 (2) 23-00 (1) 21-23 (1)*
Central & Northern Europe & European CIS	09-11 (1)	08-09 (1) 09-11 (2) 11-13 (1)	06-07 (1) 07-09 (2) 09-12 (1) 12-17 (2) 17-18 (1) 21-23 (1)	20-21 (1) 21-22 (2) 22-23 (1) 21-22 (1)*
Eastern Mediter-ranean & Middle East	09-11 (1)	08-09 (1) 09-10 (2) 10-11 (3) 11-12 (2) 12-13 (1) 20-22 (1)	06-07 (1) 07-09 (2) 09-14 (1) 14-16 (3) 16-20 (1) 20-23 (2) 23-01 (1)	20-23 (1)
Western & Central Africa	09-11 (1) 11-12 (2) 12-14 (3) 14-15 (2) 15-17 (1)	08-10 (1) 10-13 (2) 13-15 (3) 15-17 (4) 17-18 (3) 18-19 (2) 19-20 (1)	01-07 (1) 07-09 (2) 09-14 (1) 14-15 (2) 15-16 (3) 16-20 (4) 20-23 (3) 23-01 (2)	21-00 (1)
Eastern Africa	11-13 (1) 13-15 (2) 15-16 (1)	09-13 (1) 13-14 (2) 14-16 (3) 16-17 (2) 17-18 (1)	07-09 (1) 12-15 (1) 15-17 (2) 17-19 (3) 19-21 (2) 21-23 (1)	20-23 (1)
Southern Africa	09-10 (1) 10-12 (2) 12-14 (1)	07-09 (1) 09-11 (2) 11-14 (3) 14-16 (2) 16-17 (1)	01-07 (1) 07-09 (2) 09-10 (1) 12-16 (2) 16-20 (3) 20-01 (2)	19-22 (1)
Central & South Asia	09-11 (1) 17-19 (1)	08-11 (1) 16-17 (1) 17-18 (2) 18-19 (3) 19-20 (2) 20-21 (1)	02-08 (2) 08-10 (3) 10-12 (2) 12-17 (1) 17-21 (2) 21-02 (1)	06-08 (1) 19-21 (1)
Southeast Asia	09-10 (1) 10-11 (2) 11-12 (1) 16-17 (1) 17-18 (2) 18-19 (1)	07-10 (1) 10-13 (2) 13-16 (1) 16-18 (2) 18-19 (3) 19-20 (2) 20-21 (1)	03-07 (2) 07-09 (3) 09-12 (2) 12-13 (1) 21-22 (1) 22-01 (2) 01-03 (3)	01-03 (1) 03-06 (2) 06-08 (1)
Far East	15-16 (1) 16-17 (2) 17-18 (3) 18-19 (2) 19-20 (1)	09-11 (1) 14-15 (1) 15-18 (2) 18-19 (3) 19-20 (4) 20-21 (2) 21-22 (1)	04-07 (2) 07-10 (4) 10-13 (3) 13-15 (2) 15-20 (1) 20-22 (2) 22-00 (3) 00-02 (4) 02-04 (3)	01-03 (1) 03-07 (2) 07-08 (3) 08-09 (1) 03-05 (1)* 05-07 (2)* 07-08 (1)*
South Pacific & New Zealand	10-12 (1) 12-13 (2) 13-14 (3) 14-18 (4) 18-19 (3) 19-20 (2) 20-22 (1)	07-09 (1) 09-10 (2) 10-12 (3) 12-14 (2) 14-16 (3) 16-21 (4) 21-23 (3) 23-01 (2) 01-02 (1)	14-17 (1) 17-19 (2) 19-21 (3) 21-02 (4) 02-04 (3) 04-08 (2) 08-09 (3) 09-11 (4) 11-12 (3) 12-14 (2)	21-22 (1) 22-23 (2) 23-00 (3) 00-05 (4) 05-07 (3) 07-08 (2) 08-09 (1) 23-02 (1)* 02-06 (2)* 06-07 (1)*
Australasia	09-12 (1) 12-14 (2) 14-15 (3) 15-18 (4) 18-19 (3) 19-21 (2) 21-22 (1)	07-08 (1) 08-11 (2) 11-14 (1) 14-15 (2) 15-17 (3) 17-21 (4) 21-22 (3) 22-23 (2) 23-00 (1)	08-10 (4) 10-12 (3) 12-13 (2) 13-15 (1) 15-18 (2) 18-20 (1) 20-22 (2) 22-23 (3) 23-02 (4) 02-04 (3) 04-08 (2)	01-02 (1) 02-03 (2) 03-06 (3) 06-08 (2) 08-09 (1) 02-04 (1)* 04-06 (2)* 06-07 (1)*
Caribbean, Central America & Northern Countries of South America	08-09 (1) 09-10 (2) 10-12 (3) 12-15 (4) 15-17 (3) 17-18 (2) 18-19 (1)	07-08 (1) 08-09 (3) 09-11 (4) 11-13 (3) 13-17 (4) 17-19 (3) 19-20 (2) 20-21 (1)	06-07 (3) 07-09 (4) 09-11 (3) 11-14 (2) 14-16 (3) 16-23 (4) 23-02 (3) 02-06 (2)	19-20 (1) 20-21 (2) 21-22 (3) 22-04 (4) 04-05 (3) 05-06 (2) 06-08 (1) 20-23 (1)* 23-04 (2)* 04-06 (1)*
Peru, Bolivia, Paraguay, Brazil, Chile, Argentina & Uruguay	07-08 (1) 08-09 (2) 09-12 (3) 12-16 (4) 16-17 (3) 17-18 (2) 18-19 (1)	06-07 (1) 07-08 (2) 08-10 (3) 10-15 (2) 15-16 (3) 16-19 (4) 19-20 (3) 20-21 (2) 21-23 (1)	09-15 (1) 15-17 (2) 17-18 (3) 18-23 (4) 23-03 (3) 03-05 (2) 05-07 (3) 07-09 (1)	21-23 (1) 23-03 (2) 03-05 (1) 00-03 (1)*
McMurdo Sound, Antarctica	14-16 (1) 16-18 (2) 18-19 (1)	10-14 (1) 14-16 (2) 16-20 (3) 20-21 (2) 21-23 (1)	08-10 (1) 15-17 (1) 17-19 (2) 19-22 (3) 22-00 (4) 00-03 (3) 03-08 (2)	22-00 (1) 00-05 (2) 05-06 (1) 03-05 (1)*

HOW TO USE THE SHORT-SKIP CHARTS

1. In the Short-Skip Chart, the predicted times of openings can be found under the appropriate distance column of a particular meter band (10 through 160 meters) as shown in the left-hand column of the chart. For the Alaska and Hawaii Charts the predicted times of openings are found under the appropriate meter band column (15 through 80 meters) for a particular geographical region of the continental USA as shown in the left-hand column of the charts. An * indicates the best time to listen for 160 meter openings. An ** indicates possible 10 meter openings.

2. The *propagation index* is the number that appears in ( ) after the time of each predicted opening. In the Short-Skip Chart, where two numerals are shown within a single set of parentheses, the first applies to the shorter distance for which the forecast is made, and the second to the greater distance. The index indicates the number of *days* during the month on which the opening is expected to take place, as follows:

(4) Opening should occur on more than 22 days
(3) Opening should occur between 14 and 22 days
(2) Opening should occur between 7 and 13 days
(1) Opening should occur on less than 7 days

Refer to the "Last-Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific *propagation index* is likely to occur, and the signal quality that can be expected.

3. Times shown in the charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 AM; 13 is 1 PM, etc. On the Short-Skip Chart appropriate *daylight* time is used at the path midpoint. For example on a circuit between Maine and Florida, the time shown would be EDT, on a circuit between New York and Texas, the time at the midpoint would be CDT, etc. Times shown in the Hawaii Chart are in HST. To convert to daylight time in other USA time zones add 3 hours in the PDT zone; 4 hours in the MDT zone; 5 hours in the CDT zone; and 6 hours in the EDT zone. Add 10 hours to convert from HST to GMT. For example, when it is 12 noon in Honolulu, it is 15 or 3 PM in Los Angeles; 18 or 6 PM in Washington, D.C.; and 22 GMT. Time shown in the Alaska Chart is given in GMT. To convert to *daylight* time in other areas of the USA subtract 7 hours in the PDT zone; 6 hours in the MDT zone; 5 hours in the CDT zone; and 4 hours in the EDT zone. For example, at 20 GMT it is 16 or 4 PM in New York City.

4. The Short-Skip Chart is based upon a transmitted power of 75 watts CW or 300 watts PEP on sideband; the Alaska and Hawaii Charts are based upon a transmitter power of 250 watts CW or 1 KW PEP on sideband. A dipole antenna a quarter-wavelength above ground is assumed for 160 and 80 meters, a half-wave above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 dB gain above these reference levels, the *propagation index* will increase by one level; for each 10 dB loss, it will lower by one level.

5. Propagation data contained in the charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept. of Commerce, Boulder, Colorado 80302.

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CIRCLE 47 ON READER SERVICE CARD

CQ Short-Skip Propagation Chart
September & October 1999
Local Daylight Savings Time At Path Mid-Point (24-Hour Time)

Band (meters)	50-250	Distance Between Stations (miles) 250-750	750-1300	1300-2300
10	Nil	10-19 (0-1)	08-10 (1) 10-12 (1-2) 12-14 (1-3) 14-15 (1-4) 15-17 (1-3) 17-19 (1-2) 19-22 (0-1)	08-09 (1-2) 09-10 (1-3) 10-12 (2-4) 12-14 (3-4) 14-15 (4) 15-17 (3) 17-19 (2) 19-20 (1-2) 20-22 (1)
15	Nil	08-10 (0-1) 10-14 (0-2) 14-15 (-03) 15-17 (0-2) 17-21 (0-1)	08-10 (1-2) 10-14 (2-4) 14-15 (3-4) 15-17 (2-4) 17-20 (1-3) 20-22 (1-2) 22-08 (0-1)	08-09 (2) 09-10 (2-3) 10-17 (4) 17-20 (3) 20-22 (2-3) 22-23 (1-2) 23-01 (1) 01-08 (1-0)
20	12-14 (0-1) 14-17 (0-2) 17-22 (0-1)	08-10 (0-3) 10-12 (0-4) 12-14 (1-4) 14-17 (2-4) 17-18 (1-4) 18-22 (1-3) 22-03 (0-2) 03-08 (0-1)	06-08 (1-2) 08-10 (3-4) 10-18 (4) 18-22 (3-4) 22-01 (2-3) 01-03 (2) 03-06 (1)	06-08 (2) 08-10 (4) 10-14 (4-2) 14-16 (4-3) 16-22 (4) 22-00 (3-4) 00-01 (3) 01-03 (2) 03-06 (1-2)
40	08-10 (2-3) 10-12 (3-4) 12-18 (4) 18-20 (3-4) 20-23 (1-2) 23-06 (0-1) 06-08 (1-2)	08-10 (3-4) 10-12 (4-3) 12-16 (4-2) 16-18 (4-3) 18-20 (4) 20-23 (2-4) 23-01 (1-4) 01-06 (1-3) 06-08 (2-3)	08-10 (4-2) 10-12 (3-1) 12-16 (2-1) 16-18 (3-2) 18-20 (4-3) 20-01 (4) 01-04 (3-4) 04-06 (3) 06-08 (3-4)	08-10 (2-1) 10-16 (1-0) 16-18 (2-1) 18-20 (3-2) 20-04 (4) 04-06 (3-4) 06-08 (4-3)
80	07-09 (3-4) 09-11 (4) 11-19 (4-3) 19-00 (4) 00-05 (3-4) 05-07 (2-4)	07-09 (4-2) 09-11 (4-1) 11-17 (3-1) 17-19 (3-2) 19-21 (4-3) 21-07 (4)	07-09 (2-1) 09-17 (1-0) 17-19 (2-1) 19-21 (3-2) 21-22 (4-3) 22-06 (4) 06-07 (4-3)	07-09 (1-0) 09-17 (0) 17-19 (1) 19-21 (2) 21-22 (3-2) 22-04 (4-3) 04-06 (4-2) 06-07 (3-1)
160	17-19 (1-0) 19-21 (2-1) 21-06 (4) 06-08 (3-2) 08-10 (2-1) 10-12 (1-0)	18-20 (1-0) 20-21 (1) 21-03 (4-3) 03-06 (3-2) 06-08 (2-1) 08-10 (1-0)	20-21 (1-0) 21-23 (3-1) 23-03 (3) 03-06 (2-1) 06-08 (1)	21-23 (1-0) 23-03 (3-2) 03-06 (1) 06-08 (1-0)

HAWAII
September & October 1999
Openings Given in Hawaiian Standard Time

To:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	06-08 (1) 08-12 (2) 12-14 (3) 14-16 (2) 16-17 (1)	05-06 (1) 06-08 (2) 08-12 (1) 12-16 (2) 16-18 (3) 18-20 (2) 20-22 (1)	11-14 (1) 14-16 (2) 16-18 (3) 18-21 (4) 21-00 (3) 00-04 (2) 04-06 (3) 06-07 (2) 07-08 (1)	18-20 (1) 20-23 (2) 23-00 (3) 00-01 (2) 01-02 (1) 20-22 (1)* 22-00 (2)* 00-01 (1)*
Central USA	06-08 (1) 08-11 (2) 11-14 (4) 14-16 (2) 16-17 (1)	05-06 (1) 06-08 (2) 08-10 (1) 10-12 (2) 12-14 (3) 14-16 (4) 16-18 (3) 18-20 (2) 20-22 (1)	09-14 (1) 14-16 (2) 16-18 (3) 18-22 (4) 22-00 (3) 00-04 (2) 04-06 (3) 06-09 (2) 09-10 (1)	18-20 (1) 20-22 (2) 22-01 (3) 01-03 (2) 03-04 (1) 21-22 (1)* 22-00 (2)* 00-02 (1)* 02-03 (2)*
Western USA	07-09 (1) 09-11 (2) 11-14 (4) 14-16 (3) 16-18 (2) 18-19 (1)	06-07 (1) 07-09 (2) 09-14 (3) 14-17 (4) 17-19 (3) 19-22 (2) 22-00 (1)	10-15 (2) 15-17 (3) 17-19 (4) 19-00 (3) 00-02 (2) 02-04 (1) 04-06 (2) 06-08 (4) 08-10 (3)	18-19 (1) 19-20 (2) 20-02 (4) 02-04 (3) 04-05 (2) 05-06 (1) 21-22 (1)* 22-23 (2)* 23-02 (3)* 02-03 (2)* 03-04 (1)*

ALASKA
September & October 1999
Openings Given in GMT

To:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	18-20 (1) 20-23 (2) 23-00 (1)	16-18 (1) 18-22 (2) 22-01 (3) 01-02 (2) 02-03 (1)	14-16 (1) 21-23 (1) 23-00 (2) 00-02 (3) 02-03 (2) 03-04 (1)	08-12 (1)
Central USA	19-21 (1) 21-00 (2) 00-02 (1)	17-19 (1) 19-22 (2) 22-00 (3)	15-17 (1) 21-23 (1) 23-00 (2)	08-11 (1) 11-13 (2) 13-14 (1)
Central USA		00-02 (4) 02-03 (2) 03-04 (1)	00-04 (3) 04-05 (2) 05-07 (1)	
Western USA	20-22 (1) 22-00 (2) 00-02 (3) 02-03 (2) 03-04 (1)	18-21 (1) 21-23 (2) 23-02 (4) 02-03 (3) 03-05 (2) 05-06 (1)	16-18 (1) 18-20 (3) 20-00 (2) 00-02 (3) 02-04 (4) 04-05 (3) 05-06 (2) 06-10 (1)	08-11 (1) 11-14 (2) 14-16 (1) 11-14 (1)*

See explanation in "How To Use Short-Skip Charts" in box at the beginning of this column.

* Indicates best time for 80 Meter openings. Openings on 160 Meters are also likely to occur during those times when 80 Meter openings are shown with a propagation index of (2), or higher.

For 12 meter openings interpolate between 10 and 15 meter openings.

For 17 meter openings interpolate between 15 and 20 meter openings.

For 30 meter openings interpolate between 20 and 40 meter openings.

Note: The Alaska and Hawaii Propagation Charts are intended for distances *greater* than 1300 miles. For shorter distances, use the preceding Short-Skip Propagation Chart.

to many areas of the world on the 6 meter band. During September and early October it may be possible to take advantage of equinoctial-type openings on this band between the U.S. and the temperate areas of the southern hemisphere. The best times for such openings are the afternoon hours.

Later in the evening there are increasing possibilities for transequatorial (TE) type openings on 6 meters between southern locations in the USA and South America. TE conditions usually peak during late September and early October, and the best time to look for such openings is between 8 and 11 PM, local standard time. While *F-2* layer openings on 6 meters are generally steady and quite strong,TE openings are usually weak and often are accompanied by flutter fading.

Although summertime sporadic-*E* ionization should fall off considerably during September, an occasional 6 meter short-skip opening may still be possible over distances ranging between approximately 1000 and 1300 miles. The best time to check is before noon and again during the early evening.

No major meteor showers are expected during September, but some minor ones may permit meteor-scatter-type openings on the VHF bands on September 20th and for a few days thereafter.

There is usually a seasonal increase in auroral activity during equinoctial periods, so expect some 6 and 2 meter auroral-type short-skip openings during the month. The best possibilities for such openings should coincide with periods of expected radio storminess. Check the Last-Minute Forecast at the beginning of this column for those days during September that are expected to be Below Normal or Disturbed.

73, George, W3ASK

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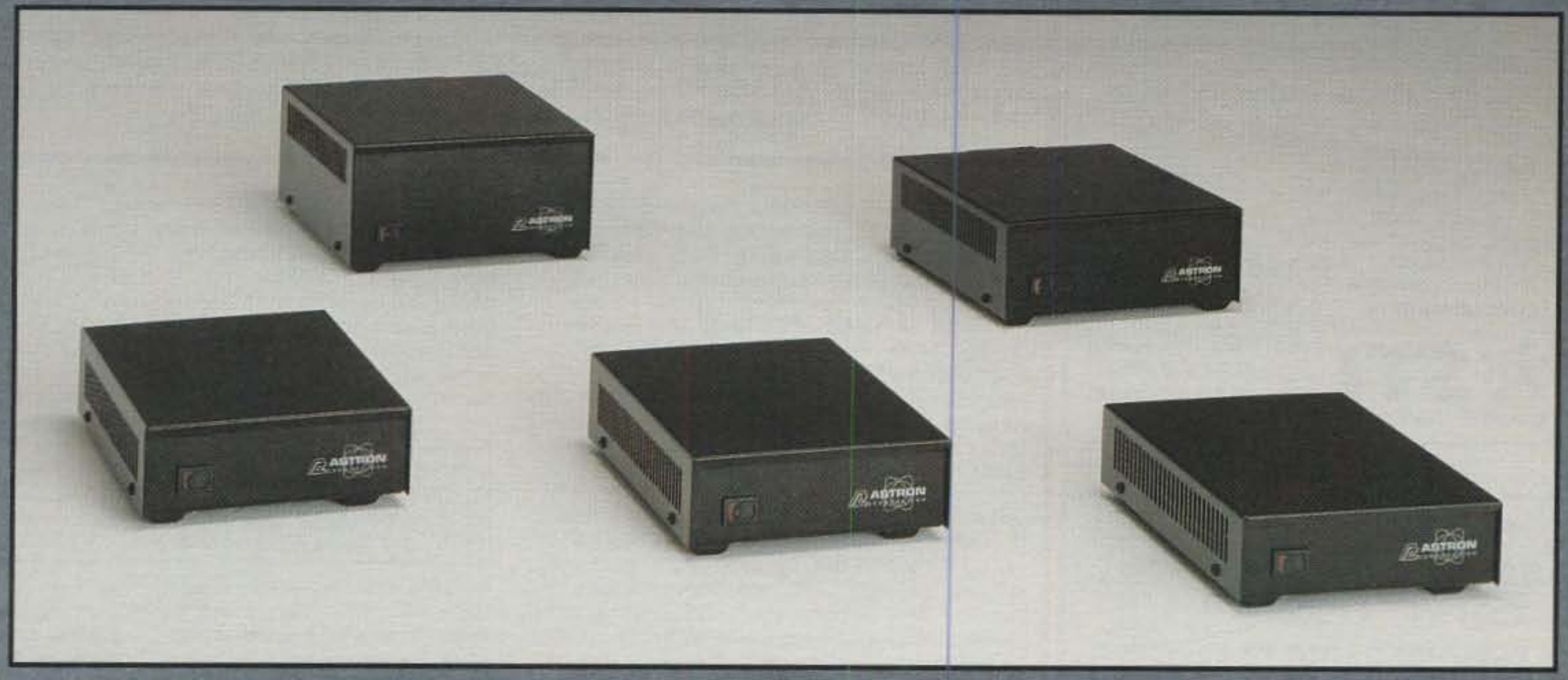

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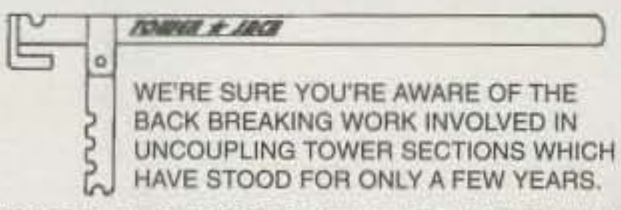

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SOVIET HAND KEYS, PA tubes, and old radios for sale. Tony, UT7CT e-mail: <tony@megastyle.com>

OE8MHQ and his XYL will be travelling in their camper van throughout the United States from September 1999 through September 2000 and would like to meet other radio amateurs. Anyone who would like to welcome this couple should contact Heimo Kienbacher, OE8MHQ, Lannerweg 132, A-9201 Krumpendorf, Austria.

KENWOOD TS-520S $350, TS-530S $475, TS-830S $500. Yaesu FT901DM $500. K1BW, 413-538-7861.

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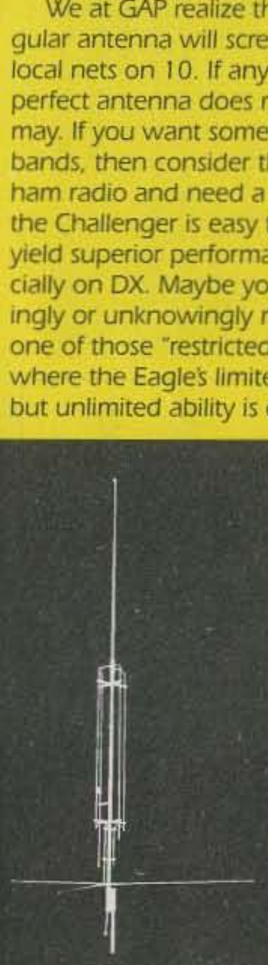

Eagle DX

Challenger DX

Voyager DX

This chart helps you select the right GAP antenna. When comparing GAPs, bandwidth is not a concern. With few exceptions, a GAP yields continuous coverage under 2:1 for the **ENTIRE BAND**.

All antennas utilize a GAP elevated asymmetric feed. A major benefit is the virtual elimination of the earth loss, so more RF radiates into the air instead of the ground. This feed is why a GAP requires **NO RADIALS**. Just as elevating a GAP offers no significant improvement to its performance, adding radials won't either, making set up a breeze.

A GAP antenna has no traps, coils or transformers. This is important. The greatest sources of failure in multiband antennas are these devices. Perhaps you heard someone discuss a trap that had melted, arced or became full of water. Improvements to these inherent problems are the focus of the antenna manufacturer, while the basic design of the antenna remains unchanged. **GAP improved the trap by eliminating it!** Removing these devices means they don't have to be tuned and, more importantly, won't be detuned by the first ice or rain. The absence of these devices improves antenna reliability, stability and increases bandwidth.

Another major advantage to a GAP antenna is its NO tune feature. Screws are simply inserted into predrilled holes with a supplied nutdriver.

The secret is out and people in the know say:

CQ–"The GAP consistently outperformed base-fed antennas...and was quieter."

73–"This is a real DX antenna, much quieter than other verticals."

RF–"To say this antenna is effective would be a real understatement. Switching back and forth on 40m between another multiband HF vertical and the GAP, there was no comparison. Signals were always stronger on the GAP, sometimes by S units, not just DB's."

Worldradio – "These guys have solved the problem associated with verticals. That is, an awful lot of RF is wallowing around and dropping into the dirt instead of going outward bound. A half-wave vertical does need radials if it is end fed (at the bottom). But the same half-wave vertical does not (as much, hardly at all) if is fed in the center."

IEEE–"Near field and power density analyses show another advantage of this antenna (asymmetric vertical dipole): it decreases the power density close to the ground, and so avoids power dissipation in the soil below it. The input impedance is very stable and almost independent of ground conductivity. This antenna can operate with high radiation efficiency in the MF AM standard broadcast band, without the classical buried ground plane, so as to yield easier installation and maintenance."

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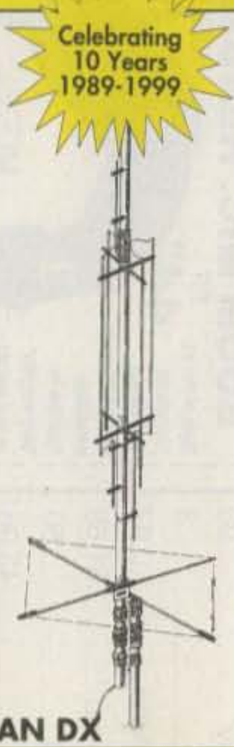

TITAN DX

This all purpose antenna is designed to operate 10m-80m, WARC bands included. It sits on a 1-1/4" pipe and can be mounted close to the ground or up on a roof. Its bandwidth and no tune feature make it an ideal antenna for the limited space environment as well as a terrific addition to the antenna farm.

MODEL	BANDS OF OPERATION											HT	WT	MOUNT	COUNTER-POISE	COST
	2m	6m	10m	12m	15m	17m	20m	30m	40m	80m	160m					
Challenger DX	■	■	■	■	■		■		■	■		31.5'	21 lbs	Drop In Ground Mount	3 Wires @ 25'	$279
Eagle DX			■	■	■	■	■		■			21.5'	19 lbs	1-1/4" pipe	80" Rigid	$289
Titan DX			■	■	■	■	■	■	■	■		25'	25 lbs	1-1/4" pipe	80" Rigid	$319
Voyager DX							■		■	■	■	45'	39 lbs	Hinged Base	3 Wires @ 57'	$399

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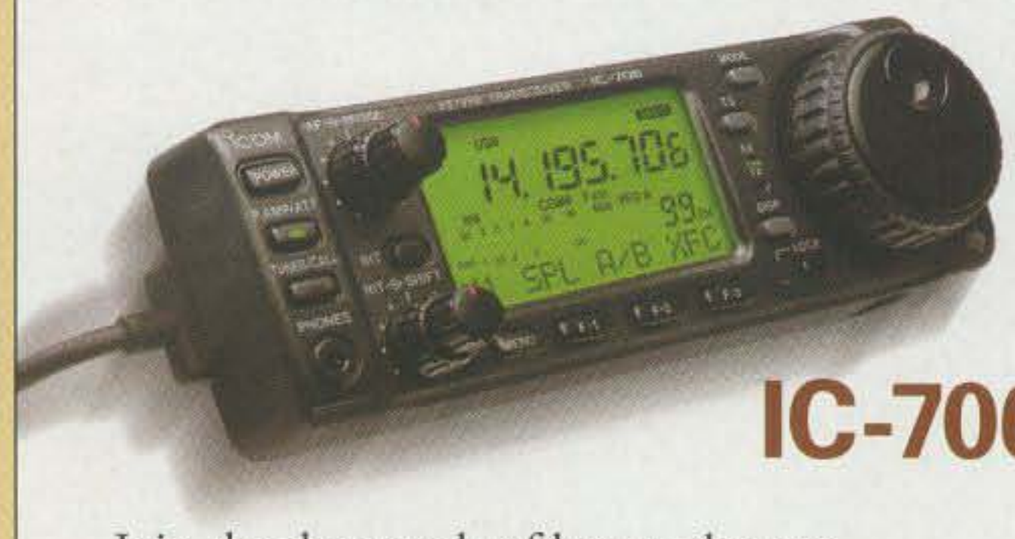

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